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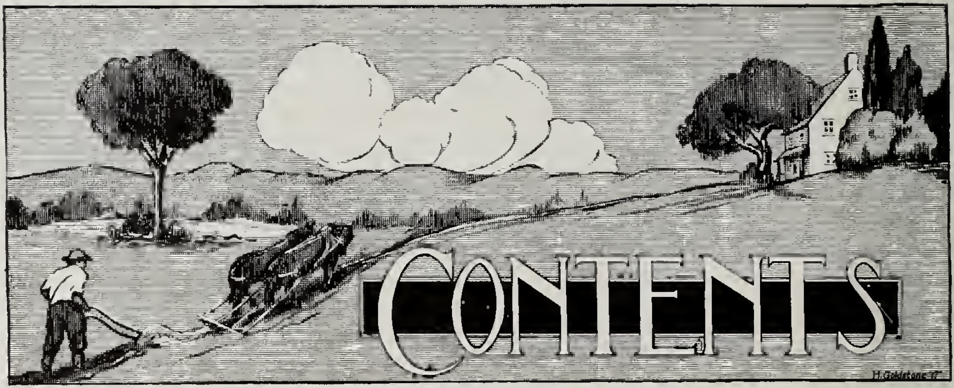

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James Malcolm Ashford—Age Nine Years

By Marie Merrill, '18.

Santa Cruz, Cal., July 18, 1916.

Dear Mother:

I got here last night but my bundle didn't. I guess I left it with the driver. He's an awful big man. He lended me his handkercheaf. The horse splashed mud on me, when I sat up near him, with his tail. Mine stuck to the candy in my pocket.

Please send me 50c cause I spent the 10c you gave me for this letter for the candy that it stuck to. I want it to ride some more on the merry-go-round with. Uncle Harry paid for me and Willie once. It felt nice and cold on your face, but the rest of you feels awful funny, so don't forget the 50c. I went in bathing this morning. I wisht you would let me go barefooted. Willie does. A breaker is a big wave that curls over. Well, one knocked me down and I did not like it because it tasted like epsom salts. Do not forget the 50c. How are you?

Your loving son and air,

James Malcolm Ashford.

P. S.—That is what dad calls me.

Santa Cruz, Cal., July 22, 1916.

Dear Mother:

I got the 50c and this letter is 10c too. I cut my finger and Aunt Louise tied it up with a piece of cloth. I did it when I made a sail boat. I can float. The stage man brought my bundle. Floating is when Uncle Harry puts his hand under your back and you lie on top of the water. Uncle Harry floats without his hand under his back and don't care when a wave goes over his head neither.

This letter is 10c more. Swimming is when you lie on your stummick and kick your arms and legs. I am going to learn.

Something is the matter with my waists. I would wear my bathing suit all the time but it shrunk, because they get dirty so quick, and a man called me long legs and I did not like it.

This letter is 10c so I guess I have nothing more to say.

Your loving son and air,

James Malcolm Ashford.

P. S.—I have a crab and a minnow fish and a lot of shells and rocks and some moss and a lot of other things to bring home so I guess you better send me a trunk.

SONNET XXIII

Santa Cruz, Cal., July 29, 1916.

Dear Mother:

I forgot to write to you till I spent all my last 10c so now this is 10c more.

I got my shoe wet the other day so I go barefooted now. I put it in the oven and it got smaller and it hurt and I guess it burned a little cause it smelled kind of funny.

I caught a fish. It was awful big and I ate it. I cooked it myself. It tasted funny. Aunt L. (that stands for Aunt Louise) says it's cause I didn't clean it but I don't think so.

Willie had a ear ake the other night and cried awful and kep me awake. Aunt L. (for Louise) put camphor in it but it didn't do any good so she gave him some kerosene or gasoline or something like that. We sleep on the floor on a bed. I guess it is in the closet in day time because it isn't there, only the floor.

How are you? Don't forget the 10c.

Your loving son and air,
James Malcolm Ashford.

Santa Cruz, Cal., July 31, 1916.

Dear Mother:

I don't want to come home but I want the 10c for this letter to spend on the train if I do. Me and Willie got awful tired of sticking around home so we went with Cap'n Smith in his fish boat. Aunt Louise didn't know it. We went way out and I began to feel awful funny. The Cap'n laffed but I felt like I went up with the boat and I came down with it but I left my stummick up there. I need that 10c awful bad. Aunt Louise sent us to bed when we got home and dried our close and mended my gray pants again on the knee.

I lost my hat and so I got a new straw one. It blew over board when, I mean the old one, we went out rowing. I guess I will be kind of glad to get home. Please send the 10c.

Your loving son and air,
James Malcolm Ashford.

Sonnet XXIII

On Her Height.

How oft this burning question comes to me,—
O, why did Mother Nature make me tall?
To her in yearning anguish then I call.
My friends do twit me over this with glee,
And I, despairing, fain afar would flee.
When perchance I'm dancing at the ball,
Led by escort brave but sadly small,
Cruel stares on all sides then I see.

But ne'er in all things are the gods unkind-
Ever do they some sweet solace give:—
As the struggling crowd impatient grows,
Trying vainly mirror space to find,
I, aloft, in higher plane do live,
Calm, unruffled, powdering my nose.

June Alexander, '16.

A Peep Into the Future

By S. A. Klinger, '16.

"All Aboard! '5:15' Tube for Mars leaves in three minutes." With that there was the usual rush and crowding that generally attends such an announcement. The mass of hungry commuters surged towards a large round steel pipe, not unlike one of the old style cannon used in the early twentieth century, but larger, much larger.

I had no sooner gotten settled in one of the spacious seats which lined either side of the large cigar-shaped car, than the throbbing of a motor was heard, and the barrel in which our interurban tube lay, began slowly to tilt upwards. Suddenly we were shot out into daylight. It was not long before Mars loomed up ahead four points off our starboard bow. The air brakes were applied, and with a slight jar we landed. A few minutes later I had alighted from the car. Being a through train we made no stops, and it was just 5:55 when I looked at my watch.

There was a great hubbub and bustle in the street, and the queer little inhabitants of Mars were running hither and thither as they went about their work. And indeed they were queer little folks. The terrific air pressure surrounding Mars, calculated approximately at fifty pounds per square inch, had impeded their growth to such an extent, that none of them exceeded four and a half feet in height. Their heads, because of the incessant thinking they did, took up a foot of this space. Half of this head was forehead denoting a goodly amount of brain. All limbs and even the head seemed attached to the body by means of ball and socket joints, for they moved in all directions. Instead of turning around and walking back if they wished to, they merely turned their feet and heads around and started in walking backwards; for on Mars, no one has a minute to lose, and to turn all the way around, would be a loss of valuable time. This no doubt is quite an improvement upon ourselves. However, this advantage was frequently causing them trouble, since at times when getting overly excited, they got mixed up; their feet going backwards, but their heads remaining to the front. Especially was this true if two of the peace-loving inhabitants of Mars happened to get into a heated argument. When suddenly in the hottest part of the discussion, one of the participants would start to run backwards, calling out to the other, to come back and fight like a man. At other times one would pivot his head around at the call of some friend from behind, and collide head on with another citizen who had done the same thing. But their heads were made of ivory, as I later learned, and so these bumps passed by unnoticed. It was most essential that their heads be made of ivory, for never could our bone-heads have satisfactorily withstood permanently, the crushing air-pressure of that planet.

The buildings ranged from a mile to five miles in height, along the broad radium-lighted streets. Upon entering the Alavantee Hotel, one goes in to the nearest booth, thousands of which line either side of the spacious corridor. After closing the door, he sits down in a chair, in front of which is a window, in the side of the booth, or Upperraiser as it is called. After speaking into the mouthpiece on the window-sill which floor you wish to get off at, the Upperraiser immediately lifts upwards. This elevator, by the way, is in many respects similar to the ancient dumb waiter. The mouthpiece into which the occupant speaks, sends the vibratory waves of the voice through the ether. Each floor has its own vibratector, and when the sound waves come in contact with the right detector, it starts the vacuum pump for that floor. Immediately the air in the upper portion of the tube is exhausted and the hydrauletic pressure from beneath, of fifty pounds, forces the machine upwards at a rapid rate. In this manner one enjoys both scenery and fresh air as he is being whisked up—quite an improvement upon the old-fashioned, cable-drawn electric elevator. There are no sickening stops at each floor. No weighty gentleman jabs his elbow into your ribs, as he crowds out. You even miss the luscious taste of some lady's hat feather as it gets mixed up with your tongue, or the pleasing sensation of its gently brushing along the inside of your ear. Again there is no one to lightly tread upon those newly acquired chilblains, over which you have split a new pair of shoes, and which now have caused you to wear some one else's "size ten." No! the Ivory Heads of Mars are far in advance of us.

But after passing the third mile in your upward flight, you get curious, and putting on your distance spectacles to watch the people in the street below, you lean out of the window too far, when suddenly your watch drops out of its pocket. However, such a trifle as that is nothing to despair over. From your vest pocket you pull out a little lodestone metal magnet, and a few minutes later, while concerned in something else, a slight "tick" is heard. Your watch has arrived. Taking your hand in from the window, you replace that precious little dollar article back in its pocket, and continue your disturbed observations.

Upon glancing through the evening paper, the announcement of a new opera direct from Jupiter attracts your attention. So going to the Thinkaphone you place that instrument at the rear of the cerebellum and think for a taxi-plane to call at 9:45. Next you think for one or two theatre tickets, as the case may be. Then comes dinner. After four hours you have finished your thirty-two course meal. Ah! those poor people of the earth. Never since the time of the ancient Shakespeareans have they enjoyed a good meal. And now, in this age of health and plenty, those of the earth merely take a food-pellet for each meal. They indulge in two, however, on Sundays and holidays.

At 9:45 the taxi-driver knocks at the front door of your apartment on the two thousand and fiftieth floor, announcing that the plane has arrived. Stepping across the foot of air that intervenes between the plane and your door step, you comfortably sink back into a pile of compressed hydrogen cushions. Before retiring later in the evening you turn on the radio-electric heating apparatus, and a few minutes later jump into a warm comfortable eider-down bed. Next morning you unroll from a small platinum cylinder, attached to the head of the bed, a sheet of paper. And while partaking of your hearty breakfast you read the record of your thoughts and dreams of the night. How handy for one who goes to school! All he has to do now is to copy the solution of a problem, over which three hours of struggle were spent in vain. And here is the translation of those thirty pages of German. How sorry one feels for those poor students who lived twenty-five hundred years ago, in nineteen sixteen. Such an instrument as this would really have been worth something in those days. Yes indeed, the Ivory-domes of the Marites are far, far superior to us, who are, all of us, bone-heads.

Before the Day of B. V. D.'s

By Charles Treadway Rickey, '16.

As John Brinkley and I were riding over the desert, south of Walker Lake, we passed between two red buttes and on into a large flat, covered with sage and rabbit brush. Just as we were about to descend into it we saw another horseman coming towards us at a snail's pace. As he drew close we made out the bent figure of an old Indian. He must have been very old, for his hair was gray, and his face was seamed with tiny wrinkles. As he passed he grunted a "Hello" at John and kicked his old pony into a slow dog trot.

"That old feller's Mahala is old Chief Winnemucca's girl. Warren Knisman come purty near havin' to take her fur his wife, when he was agent on the reservation."

I naturally asked how it happened, because I had heard many stories of the old pioneer, and I had become interested in him.

"Well, it was this-a-way." The old frontiersman always started his stories in this manner. "Warren had been given these reservation Injuns to look after and see that they didn't go off on a rampage, killin' people and stealin' horses an' cattle. Uncle Sam had chosen him fur this job 'cause he jabbered their talk purty well and he was honest. The gover'ment knew thet he wouldn't buy cheap calico for 'em an' charge 'em fur heavy clothes. They knew thet if he made any bargains he'd stick to 'em.

"The agint thet was sent out afore him had cheated the Injuns and the gover'ment out o' $15,000. The Injuns were wiser'n he thought they were an' they found it out. It made 'em mad an' they kind o' made mincemeat out o' him. Then they went on the warpath. Warren was sent out about the time they war brought back to the reservation.

"He got along fine till a cold spell set in an' they came to him an' told him thet his men were cold and wanted warm clothes. Warren, he set an' thought for a spell and finally told the old Piute thet he'd ask the Great White Chief at Washington for one suit for each brave.

"Warren knew purty well how many of 'em he had on the reservation and sent an order for that number.

"A heavy storm set in, the stages were held up an' the clothes didn't come as soon as Warren had told the chief they would. Those Piutes kept gettin' colder an' madder all the time. When they'd pass him instead o' sayin' 'How,' an' smilin', they'd growl 'Ugh!' an' a scowl as black as a thunder cloud 'd come over their faces. Warren began to see this an' he got mighty uneasy 'cause he felt responsible for their doin's an' his scalp.

"A month passed an' no underclothes! By this time the bucks began to wear their feathers and once 'n a while do a li'le dancin' an' put on some paint. Warren remembered what had happened to the agint afore him an' he got so nervous that he couldn't sleep very sound. Finally he couldn't stand it any longer, so one cold, crisp day he saddled up his old pony an' started to Carson to see what he could find of the underclothes.

"He was just about to climb on his horse when Mr. Chief walks up an' asks him where he's goin'. Warren told him thet he was goin' to Carson to git the underclothes. The big Injun showed his teeth in a grin and said: 'Hu! Me, two my brudder go!' an' walked off. There was nothing for Warren to do but say 'Come along.' He didn't like their company much, 'cause he knew thet if they got any whiskey—well, he wouldn't come back with the underclothes, an' he did hate to see the critters freeze.

"Across the desert he started with his three guardian angels right at his old horse's tail. This o' course made the trip pleasant, 'cause he didn't know when those companions wouldn't like the way he was a-ridin' an' would take him off f'm his horse with a piece o' lead. An' he didn't dare look back often, 'cause he knew if he did they'd think he didn't trust 'em an' that'd be just like skinnin' his own scalp. So they rode on mile after mile, none of 'em quite sure how long Warren could boast of a long foretop.

"About this time they went over thet saddle in between those two red buttes and Warren saw a campfire down in the flat on the other side. When he got a little ways down the mountain he saw thet it was a freight team camped. The skinner an' his swamper was smokin' their pipes by a fire when Warren rode up to 'em.

"The teamster yelled out, 'Hello, Warren! What you a-doin' out here alone? How's all o' Uncle Sam's chil'ren?'

"'I ain't alone,' answers Warren. 'I've got three o' the babies with me.' As he said this he looked back for 'em, but they wasn't there. He'd lost 'em some place. But he had a feelin' that somebody was a-watchin' him out o' the darkness. This kind o' made him uneasy like. But he didn't let Drew, the skinner, see it, 'cause he'd joshed Warren about his children when he first took his job.

"Drew asked him to camp with him all night an' Warren was mighty glad to do it, 'cause he knew thet the three Injuns wouldn't bother him so long as he had some other white men with him.

"'What you got on that wagon?' asked Warren.

"'Oh, I got some grub, an' I guess its clothes fur them heathens o' yours.'

"Warren let out a warwhoop, almost scarin' Drew out o' his senses. But he didn't want Drew to know how near to trouble he'd been, so he pertended he was only glad o' the saved time an' jus' said, 'Thet's good. It's been purty cold fur 'em an' the grub was a-gittin' kind o' low. Let's turn in. I'm tired. I've come a right smart way to-day.'

"The next mornin' they was wakened about daylight by the talkin' o' men an' the trampin' o' horses. The flat was covered with redskins. Hundreds o' 'em. Some walkin', some ridin', but all in feathers an' paint. It looked like every Piute in Nevada had gone on the warpath. An' I'll be blest if the flat weren't white with frost—where you could see it. Ol' Jack wasn't gona miss the celebration," and the old man chuckled at the reminiscence.

"'Well, I guess you came jus' in time, Drew!' said Warren. 'These Injuns began to think I was crooked too. You an' your swamper kin help me give 'em their stuff an' then you kin start back.'

"Just then one o' the chiefs came ridin' up and Warren told him thet his stuff was on the team and to have his men come by the back end o' the wagons one at a time an' he'd give 'em their clothes.

"The chief rode off an' in a li'le while the Injuns started to come up one at a time. Warren gave each one a suit of underwear and a present of some tabacker. They got through about noon and Drew started for Soda Springs.

"Jus' as he got over the hill an' old Injun came over the saddle on the other side o' the flat. He had been out o' the camp fur years an' Warren had forgotten him. He'd promised to give every buck a suit o' underwear an' he'd already given the last suit out. He looked at the faces around him an' they looked an' sounded like a thunder storm about to break. He knew thet when the old Piute reached 'em it would break. The clouds kept gettin' blacker an' the thunder louder as the old Injun came across the flat. Some of 'em began to pile up brush an' get ready fur a fire. Warren knew what it was fur.

"Suddenly an' idea came to him an' he began gettin' the only suit o' underclothes for fifty miles around, 'cept the ones he'd given away. When the old critter came up to him an' grunted somethin' like underclothes, Warren handed him his own suit which he had taken off, fergettin' how cold it was. Then the Injuns all began dancin' an' hollerin' an' wavin' their tommyhawks. Warren thought that they were mad 'cause he'd given the old man his own clothes an' that they was goin' to burn him. He was mistaken. The chief Winnemucca came up an' said:

" 'You Piute. You take my girl. Your Mahala. Me no chief; you heap big chief.'

" 'I'll be one o' your tribe an' I'll be chief, but bye 'n bye me catch 'em immigrant girl,' was Warren's answer.

"Winnemucca gave him the big tomahawk* he was a-wieldin', an' they all sat down an' smoked the peace pipe."

Then, after a pause, during which the old frontiersman looked reflectively at the sage-covered flat now silvering in the dimming light,—"Warren was the only white chief the Piutes ever had."

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*The tomahawk is now owned by the author, a grandson of Warren Knisman.

A Boy Scout's First Night Out

By Fred B. Banfield, '16.

Somewhere in the foothills of El Dorado will be found an old log cabin. It stands half hidden under the protecting arms of two rugged oaks. At its rear a craggy cliff reaches above the trees, sending its cathedral spires high into the blue expanse. I shall never forget that long, exciting night under the shelter of that protecting roof. It was in the month of September that I explored that foreign country and learned of the creatures of the wood.

I had lived in the city from babyhood, but my mind was always craving for Nature's wilds. The Boy Scouts' squad had been my chief pleasure for several years, but we had never ventured into the Sierras; we had taken short trips in and about the nearby country, but never had my squad spent a night out with Nature. Now the chance of my life had shown itself, for several of my squad and I had been invited to camp with Uncle on his Paradise Range for a few weeks. I was a seasoned scout and anxious to visit the regions of tall timber.

The day of surprises arrived. For me, it began wrong. I overslept. In my haste to catch the train, I forgot my purse and had to go back after it. Finally I reached the station just in time to see my train pulling out of the far end of the yards. What could I do? There was only one thing to do: wait two hours for the next train over the divide. I was finally seated on the cushions for a lonely two hours' ride to Greenwood. The call of the station was music to my ears. Upon alighting from the train, I found myself in a strange land. Rugged hills rolled off to all sides. To my disappointment, my crowd had gone on and were to meet me at Uncle's summer shack. Having obtained this bit of pleasing information from the station agent, I struck out on foot.

The miles seemed to lengthen as I trudged on, and night was slowly approaching. For the last mile I had meandered thru a dense stretch of underwood, and every little sound made me grow more restless and uneasy. My imagination grew wonderfully vivid. I heard the crack of a twig. It sounded like the shot of a pistol to my sensitive ears. Then followed a disturbance in the dry brush directly behind me. It stopped there. I grew afraid to move ahead for fear the beast would follow me, and my mind would not allow me to see what it was that made such a hubbub. At last I became courageous and looked behind. There was nothing there but an innocent tree squirrel seated on a stump eating a nut. Again, just as I was emerging from that stretch of woods, I was nearly scared out of my wits by a covey of quail scooting over the dry leaves of the underbrush. To me it seemed a pack of hungry timber wolves, and I could hardly believe that the little bodies I saw made all the noise.

Oh, joy! As I came around a bend in the road, the old log cabin, tucked away under the oaks and dimly outlined against the gray granite wall which towered up behind it, stood before me. Before it blazed a cheery fire. I saw no one near, but expected to find my friends in the cabin. I forgot my weariness and rushed into the shack. It was empty. All that met my eyes was a continuous barren wall and a bit of white paper tacked up near the doorway. It proved to be a note containing some more hard luck. Uncle had taken the boys down to the river that they might get some good early morning fishing under the Big Falls. My heart seemed to leave me for a moment, but hunger stirred me to action again.

My knapsack was soon opened and a supper of flapjacks and coffee prepared. Of course I had to burn the cakes, but hunger overlooked that rash act. The frugal meal was soon completed, and I began examining the interior of the shack for a place to sleep, for the night was coming down and I was dead tired. They had not stopped to clean the cabin out. The floor was strewn with dry oak leaves. It was a square room with no partitions. In one corner I found a miner's bunk—a rough platform about two feet wide and about the same height from the floor. Upon this rickety structure I made my bed.

Tired, but wide awake to the strange noises of night, I put myself to bed. I could hear a wind playing about outside, and what queer sounds it created! My mind grew frightened. There was a crash overhead. My heart beat hard. The deadening thud that followed created trying visions in my mind. Some old dead limb that the wind dislodged had found a new location on the roof of my shelter.

Amid all these sounds I drifted into a doze, but my mind was still subconscious to all about me. My sense of hearing soon located a strange something among the leaves of the floor. In that strange room it sounded loud and clear. I felt alone. I listened intently and all grew silent. Oh, how silent! The wind had gone down. The suspense became unbearable. At last the silence was broken. Another disturbance amid the leaves, and not far from my bunk! Why did I ever come into this infernal country? I strained my eyes. I could see nothing. Again that fearful silence. I could hear my heart beat. I held my breath and it seemed that my heartbeats created echoes against the barren walls. I grew cold with fear. A sweat stood out on my forehead and my hair fairly raised from my head. Again that rustle in the leaves. It seemed so heavy, yet strange and dreadful. I thought of ghosts. I thought of prowling beasts. This half-silent tormentor was developing a suspense that nearly paralyzed my flood of thoughts. I cringed with fear. My mind grew active again. I thought of snakes. That was it! A snake was crawl—, crawl—, crawling over those dry leaves toward my bed. Dread vermin! I nearly screamed. It was a rattler, most likely. This was a rocky country; that rocky cliff stood just behind the cabin. Again that rasp of coils against the leaves. I trembled with fear as it drew nearer inch by inch.

Suddenly a reaction came over me. My cold, clammy feeling had flown. In its stead my veins tingled with the warm blood of excitement. I grew courageous. I determined to get a brand from the fire and search to kill this monster. It was a foolish thing to do, but I did it. I ventured from the bed. Cautiously I put my foot upon the floor. Horrors! I thought my heart would never beat again. My breath cut short. On my second step toward the door my foot fell upon something which seemed to twist and writhe under my weight. My nerves prepared for the dread sting of those death-bearing fangs. My muscles contracted. I was rigid from head to foot. I unconsciously relieved the pressure on my foot. If there is an example of slowness, this realized it. Slowly I felt the creature move. It seemed an hour that I stood there waiting for something to happen. That fearful thing there below my foot ceased to move. I listened with ears wide open. There was another rustle from the far side of the room. Ah, my stranger had gone! I put my foot down cautiously and——there came to my ears a faint squeak of a field mouse as I pressed my weight upon the leaves. Was I in a snake's den? No! Instead I was molesting the contented home of some tiny, innocent, white-stomached field mice.

As my blood cooled down from the excitement of my experience, I grew cold. In a hazy state of mind I sought the bunk—the clothes were still warm. I set to resolving; I determined to forget fear. I had felt the cold, dread feeling give way to that tingling warm sensation of excitement. I was not exhausted. I felt invigorated. This old miner's cabin of my uncle's had received me as a timid city lad—a lad afraid of Nature's creatures which keep the lonely woodsman company at night. I was to leave it well acquainted with the life of night which is ever friendly with the man who understands.

The Diary of Ola O'Leary

By A. J. Mains, '16.

August 3.—This was a hot day to-day. There was a snake in the milk-house to-night. He ran in front of me and I was so scared I dropped a pan of milk. Mrs. Black, she was so mad she almost hit me with the pan. I wish I didn't have to stay in this cranky place. There was a new farm-hand come to-night. I just seen his back; he has curly red hair.

August 4.—It wasn't so hot to-day. We had a breeze from the east, but I packed water to the tomater vines all morning and was 'most dead by noon. The new hand is named Bradley, and he is good-looking, too. I asked him if he was any relation to the Bradleys over in Alameda, but he said no. When I carried the clabber milk out to the chickens this evening he opened the gate for me. I just said thank you. I wisht that I'd stopped to talk.

August 9.—Hot to-day. I had extry dishes at noon. I thought I'd never get through. If people didn't eat it would be alright. That old snake is in the milk-house yet; I guess he's going to stay. He opened the gate again this evening and then he took the milk and carried it. We talked while the chickens was eatin', and he asked me what my name was, and I said Ola Carey O'Leary, and then he said his was Charles. When I came in Mrs. Black was mad because she said I spent all my time gabbin'. I don't care.

August 14.—Hot again. Nothing has happened. He opens the gate every evening.

August 16.—Hot to-day. I fried doughnuts this morning and Mrs. Black she jawed worse'n usual. I burnt my hand with the grease. It burnt awful. After supper I went round to the front of the house and sat down under the apple tree. Pretty soon it got dark and I heard Mrs. Black call me to come and set the bread, but I pretended not to hear, and she went off mad as anything. Then after a while I heard a owl hooting. An owl sounds awful mournful, only maybe a dove is mournfuller, and I felt so awful I just began to cry, and then I heard somebody come and sit down by me and it was him. He said what was the matter that I was crying, and I said it was because my hand hurt where I burnt it. Then he asked how was it I burnt it, and I told him, and he took my hand and held it a long time, and then he said to put some vaseline on it.

August 21.—Extra hot. We made kraut to-day and set the Plymouth Rock hen. She picked me awful hard. That snake is still in the milk-house. I wisht somebody would scare it away. We sat on the porch this evening.

September 3.—He says I must leave this place to-morrow. We are going to rent the Davis place. The snake done it. It was this evening. I went out to skim the milk and it was kind of dark and I was scared to go in so I stood and looked in a long time, and pretty soon he came up, and said was I waiting for him? And I said no I was scared because there was a snake in there. And he said would I be scared if he went in with me, and I said no; so he took my hand and we went in. And we looked around for the snake and looked and looked and couldn't see none, and he had holt of my hand all the time. Then, pretty soon, we stood still and there wasn't any sound, and we stood and stood, and he was still holding my hand, and after a while I said I guess'd I'd better skim the milk. And so I skimmed and skimmed and we never said nothing and there wasn't no sound at all. Then, pretty soon, when I was just putting up a pan of milk I saw the snake on the shelf right in front of me and I jumped so I dropped the pan. And then I was scared and I said, Oh, what would Mrs. Black do! And he kicked the pan away and said, "Nothing," real mad and then he walked to me right through the milk. Ain't it funny the way things happen?

Something New in Footwear

By Ted Maas, '17.

Miss Helen Francis was dressing for the matinee. The day was bright and the plans for the day were perfect. She was to meet the "only man" and see a favorite actor in a new play. Her new dress spread on her dainty bed was pretty and becoming. Then why the pucker of annoyance on her usually placid brow? Helen was displeased at herself, a very much more annoying condition than when the offender is another. She had ordered a very pretty hat but, because of some slight alterations, it was to be delivered by noon of that day. The hat had not arrived. Her mother had reminded her twice to 'phone the milliner and ask for prompt delivery, but she had neglected to do so. Why had she been so careless! Quite often of late she had suffered from her own carelessness and what was worse, the real source of her annoyance, "he," had railed her on her carelessness, and had said she was as "carefree as a kitten." How she longed to convince him of his error.

"I'll have to wear my old hat," she sighed as she absently twirled the ring on her third finger and gazed down the street from her curtained window.

She was just finishing fastening one trim tan boot when the doorbell rang. A breathless pause failed to reveal the footsteps of the maid, so hastily throwing a kimono about her she rushed down the stairs just in time to stop the retreating delivery boy. Good! It was the hat. A little song floated from her room as she finished her toilet. She admired the hat from this angle and that for so long, that, after snapping her watch when all was right, she had time only to call a hasty good-by to her mother, busy with a caller in the living room.

Fortunately she caught a car at once. What if it was crowded! She willingly clung to a strap and felt at peace with the world. Half way in, a transfer point partly emptied the car and Helen settled comfortably in a seat. How cheerful the day was! Her glance dropped carelessly to the floor and remained there frozen. Horrors! peeping demurely from the folds of her dainty skirt was one tan boot and one black one. For one moment Helen was held spellbound, the next, and then her quick wit had noted the fact that the lady on her right wore tan boots, and with a deft movement the tan foot stole cautiously toward its tan neighbor. What mattered if the unconscious lady displayed three tan feet? She felt hysterically inclined to brazenly introduce an innovation in footwear. Anyway, her skirt was longer than usual. She must think of a way out of her predicament, but what? Take the next car back and change her shoes? No time! Get off and telephone "him" that she couldn't come—had broken her neck? No, that would be considered careless. Buy new shoes? She felt her mesh bag—one dollar and a little small change. Couldn't be done. Tie up one foot and have a wrenched ankle? Careless again! In desperation she looked out of the car window. They were passing a shoe store decorated with a festoon of shining rubbers. "The very thing, a good high pair," she sighed in relief. A block from her meeting place Helen alighted and was soon in a shoe-store seat with one foot carefully tucked back as a clerk hurried to do her bidding. He fitted her foot quickly and carefully. She thrust the dollar into his hand, begging him to wait upon the hurried mother with the restless child who stood conveniently waiting. Hastily she donned the other rubber and was off.

Steven stepped briskly to her side.

"Fine, just on time," he said. Then proving that he was in the highest of spirits, for only then did he use slang:

"Wow, pipe the fresh lid." He clutched her elbow in a proprietory grip and steered her across the crowded street. They fell into the procession wending its way theaterward. "I never saw you look so dazzling." "Naturally," she parried, "you don't realize how bright I am."

How entrancing the music was and how brilliant the scene. Helen saw herself as the heroine and Steven as the hero, as everyone under forty does.

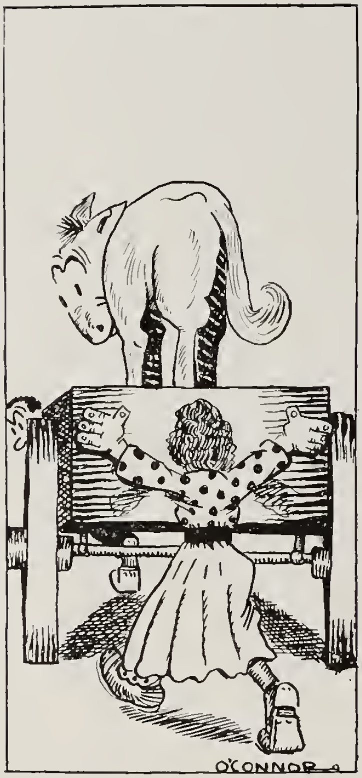
After the play she went into the dressing room to adjust her hat. Steven met her with a look of consternation. "Helen, it's raining. I can get an umbrella, but your feet will be soaked before we can get a car." "Yes, I know. I stopped and got some rubbers this afternoon. I have them on." "Sure enough, you have. Well, if that isn't foresight! I remember now I saw the rain signals this morning, but to think of you actually preparing for it! That's the kind of a girl to have. I'll never call you careless any more."

Perhaps Helen swallowed a chuckle. Anyway, her cheeks got pretty red. The queer part of it was that this incident actually made her less careless in the future.

The Country Dance

By Helen Greninger, '17.

Several years ago my aunt, Cousin Charlie and myself spent the summer in a little country town in northern Montana. While there, I had any number of varied experiences, from falling down a well to hunting wild-cats. But the adventure that impressed itself most deeply upon me was a visit to a country dance.



Charlie went with me, and as the affair was in another village some four miles away, we decided to hire a horse and buggy.

The man who rented us the rig assured us that the horse was a fast one. He really was—fast to one spot most of the time. The greater part of the distance Charlie was pulling the beast and I was shoving the buggy. We were persistent and managed to cover the four miles in as many hours.

When we got there the dance was just beginning. The platform was out of doors and was illuminated by a kerosene lamp which threw a picturesque glow on the assembled guests.

In the crowd we noticed a group of girls who looked as if they too were from the city, so we stepped over and introduced ourselves. They were very nice and asked us if we were dancing. Upon which we answered, "Oui," which showed our knowledge of French and impressed the aborigines.

Presently the orchestra struck up a tune. He played a fiddle and the strain was "Pop—Goes the Weasel." The floor manager stepped to the center of the floor and blew a whistle. His evening attire included a red flannel shirt and hob-nailed boots.

"Form a set for a quadrille," he ordered.

We confessed ignorance, so he placed us, and promised to call out the figures.

"Head couples bow—swing your gals—down lover's lane—all balance—right fours—left fours—salute opposite ladies," he yelled.

Of course, we executed it perfectly. It was as easy as reading a Chinese hymn. The floor manager retired to a corner and swore a great oath.

"Can you do the next figger?" he asked when he returned.

I told him we would try it if he drew a map.

"It's easy," he assured us.

"So is getting buried," said Charlie. "What is it?"

"I'll, tell you. Billy, shake her up lively."

The orchestra obeyed. It spit on its hands and struck up a spirited variation of "Pop—Goes the Weasel."

"Two steps back—right front into line—ladies change—five steps—glide—all dip," the manager shouted.

We obeyed as well as we could with varying results until the set appeared to have been hit by a hurricane.

After that we had a brief breathing spell. Then, by special request, the orchestra played a polka. The name of it was, "Pop—Goes the Weasel."

Once more the floor manager gave directions which we obeyed implicitly. At least I did and found myself in misery while Charlie found himself in a barn.

That ended the dancing as far as we were concerned, so we put our horse in the wagon and drew him home.

As we plodded along down the road, the orchestra struck up a simple ballad, the familiar strains of which I recognized as "Pop—Goes the Weasel."

The Poorest Man in Town

By Sylvain Schwartz, '17.

The Prominent Four had met to dispose of Bill Hawkins, for he was a menace to Squidgeville. The Syndicate Real Estate Company, with a branch office in the town, had advertised the advantages of the place for miles along the railroad with brilliant posters, challenging:—

Have you visited Squidgeville?
Population 4,000—All Prosperous!

Bill Hawkins was far from prosperous. So the Prominent Four had met to dispose of him.

Upon stepping off the train, the home-seeker's first impression of prosperity was immediately killed, for the trim little station house was the daily haunt of this unpopular Bill Hawkins. Once in a while he could be found lending a hand to the uniformed railroad employees, but more often he was seen lounging idly in the sun, feeding the station house pigeons from a half-loaf under his arm, while they clustered about him until the stray tourist, happening upon the scene, might imagine himself transported to a miniature St. Mark's Cathedral. Bill Hawkins was beloved of pigeons, for hunger is a primitive thing, and these birds are utterly lacking in civic pride.

Many propositions had been offered to Bill to settle himself elsewhere. He listened to all of them and——remained. The superior attractions of Harristown, fifteen miles up the river, were outlined to him in a manner never before even admitted in Squidgeville. But he still lingered and, if real estate circulars were to speak the truth, the circumstances demanded an immediate change, such as:—

Population 4,001—One poor.

Bill Hawkins was the poorest man in town.

And so the Prominent Four met in the office of Judge Crothers in the Crothers Building opposite the station. As host, the Judge was the first to open the subject.

"Now, friends," he began, "this man is an eyesore. Can anyone doubt it?"

Evidently no one could, for he very closely scrutinized the other three over the rim of his glasses and three nods disclaimed the slightest intention of doubt. So he went on: "And we can't get rid of him, because he has never harmed a man, woman or child since he's drifted from the-Lord-knows-where. But the only way to cure poverty is to put something in its place, and that something is money. Is that reasonable?"

"As reasonable as rain on a rainy day," agreed Herman Duncan. The others said nothing, fearful of allowing their suspicions to anticipate more than was actually coming.

"Hence," the Judge continued, "it's up to the well-known citizens of Squidgeville to put this fellow up in business and make a man of him."

Herman Duncan was again the first to speak. His brain had leaped the Judge's introductory remarks and he felt prepared.

"I take it you mean by private subscription, Judge?" he queried.

"Exactly," as if pleased with the intelligence that grasped his meaning so quickly.

"Well," said Herman, "if my wife Emmy wasn't so sick all winter, and the doctor's bills weren't so confounded big, I personally would have been more than glad to give fifty dollars to start the ball a-rolling." He took his seat with the air of one who has done his best and can do no more.

Lou Ethergill rose, with his tanned, weather-beaten face set in mournful lines. "Boys," he said, "every word the Judge says is correct. Yessir, every word hits the naii on the head. *But* the Judge must not think he's the only one's had trouble. Look what my daughter Rita's divorce cost me. A man can't see his own child suffer, can he? And she ain't over it yet——" He broke off and sat down hastily as if further recital of this family skeleton was more than he could bear.

The murmur of sympathy that followed was broken by Henry Sikes with a tremendous blow on the arm of his chair.

"Sickness is bad enough," he fired to Judge Crothers, "and troubles with your kids are bad, too, but when a man has a fire that takes away six of your best horses—— Oh, I know I got insurance," to the Judge's question, "but do you remember the fire three months later, a couple of hours after my insurance expired? Oh, no, I haven't lost no money this winter. Oh, no, it's a mistake!" Giving the arm of his chair another vicious punch, he folded his arms across his chest, Napoleon fashion, and strode up and down the room with quick, nervous steps.

The slow, sarcastic drawl of Herman Duncan brought him to a listening attitude on a line with the window.

"Well," he declared, "I don't see the Lord Almighty pinnin' any medals on me for storin' up good fortune considerin' the fac' that a cyclone travellin' up the next state lets its tail gather up the best part of my farm."

The summing up of all this bad luck sank into the thoughts of Henry Sikes. "That sure was hard times, Herman," he agreed. Just then his attention was attracted. A shout of laughter had drawn his gaze thru the window to a group on the flagstone of the station house opposite. With uncut hair hanging over his face and a battered hat set at a sixty-degree angle on the back of his head, stood the untidy Bill Hawkins, feeding his flock from a fast-diminishing loaf, to the delight of half a dozen children.

Henry Sikes watched for a moment in disgusted silence. The other three continued to discuss misfortunes. An incoming train sounded and the roar and noise of it as it rushed into the station frightened and scattered the pigeons into mid-air. The noise ceased and the birds ventured to earth again. The few people who had got off the train stopped to watch the feeding process, while those who remained on board waved from the windows, and one threw a coin which one of the children hastily snapped up and brought to Hawkins.

The concentrated silence of Sikes brought the others to the window. They saw Bill Hawkins close the child's hand over the money and point to a beggar whom Jim had seen thrown off a freight train. Evidently he was much in want of food, for he stood with hungry eyes in front of a baker shop. The little one quickly turned and ran across the street. On receiving the money the old man turned and shambled into the shop. On his emerging with one loaf under his arm and another half-devoured, Bill Hawkins threw his head back and laughed until his battered hat fell to the pavement, his merriment ending in a smile of sheer unhampered joy, while the Prominent Four helplessly envied the God-light on the face of the Poorest Man in Town.

Lead

By C. R. Johnson, '16J.

Lead, a bluish white or gray metal, is ductile and malleable, and easily cut with a pocket knife or common wood saw. The metal is highly lustrous when freshly cut, but soon the air causes it to become dull, by oxidation. It is absolutely non-elastic, one of its most striking properties. The melting point is very low, 615° Fahrenheit, which makes it valuable for commercial use.

Lead is found extensively in Colorado, Nevada, Utah, Idaho, Montana, Missouri and in the Mississippi valley. In Nevada it occurs in pockets in limestone, while in many other places it is found in large veins. Very seldom is lead taken from a mine in a pure state. Galena, a compound of lead, sulphur and white lead, is the most common mixture.

The lead ore is generally roasted directly after it comes from the mine. The process often has to be repeated until all the impure materials are yielded up.

In referring to history, we find that the ancient Greeks, Romans and Phoenicians used this metal extensively. Many of the old relics that are preserved to-day are composed of lead.

In the manufacture of paint, lead is converted into white lead, which is valuable as a base for paint. There are various methods of converting lead into white lead. A very common process is to place perforated, rolled sheet lead in a large pot and pour acetic acid over it. On top of this, tan-bark is placed and the jar is set away for about six weeks. Then the white lead is scraped from the original, or the part which did not change form. The annual production of white lead in the United States is over 75,500 tons. In painting, different shades of color are added to the white lead until any desired color is obtained.

Lead is extensively used in plumbing work. In nearly every sanitary plumbing system it is used to some extent. A very important use is soldering. Common solder is the simple mixture of lead and tin, varying in relative quantities to suit the conditions.

Another important alloy is wiping solder. This is a mixture of three parts lead and two parts tin. Wiping solder requires close attention in mixing and using. If over-heated it becomes too "coarse," which will make a porous and possibly leaky joint. On the other hand, it may be made too "fine," which will cause difficulty in wiping. Wiping a joint is quite difficult, and if one has not practiced the art, he is liable to have a few burned fingers before the job is finished. The hot solder is put on by a continuous dropping from a ladle, and then wiped in a uniform ring, about the connection, by means of a pad some three inches square.

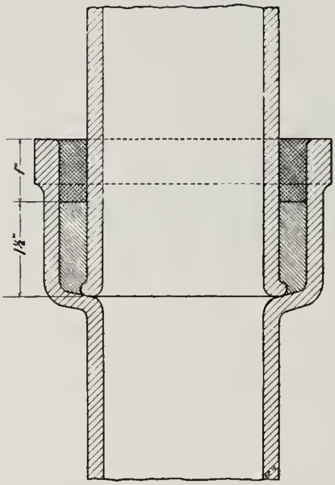


Fig. 1.

Another interesting use for lead is that of making calked joints. A calked joint is one which is made at the union of two cast iron or iron and brass pipes. For a calked joint, there must be a hub on one end of the pipe. The hub is generally about two and one-half inches deep and large enough to leave a space around the inserted end of the pipe, which space is filled to within about an inch of the top with oakum (Fig. 1). Then molten lead is poured into the top and hammered around all edges to make them tight.

It may become necessary for a hub to be poured in a very inconvenient position, such as an inverted hub. In that case a braid of asbestos is placed about the pipe, with an opening where the ends come together. Putty or, preferably, moistened clay is placed above the level to which the lead must run, leaving a channel to the space in the hub (Fig. 2). In this manner a regular mould is made in which the lead will run to the highest point in the hub. It is very important that a joint is made perfect by only one pouring, or the joint may not be tight.

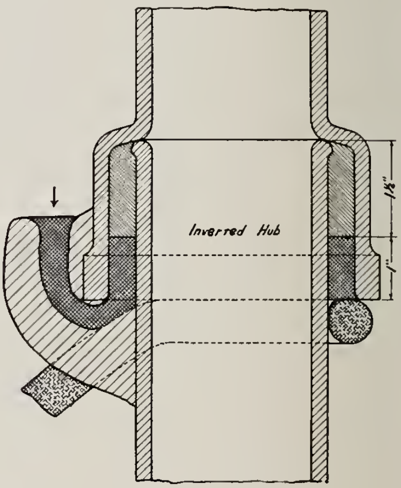


Fig. 2.

Sometimes a joint must be poured with water trickling in it. This is quite dangerous, for hot metal coming in contact with water forms steam which causes an explosion, and this is liable to cause burns from flying metal. In the case of a wet joint, bread is placed in the pipe to soak up the water, which allows a short time for the pouring. The bread then softens and washes away. Another quite satisfactory way is to place powdered rosin, or some oil, in the hub before pouring.

There are many other lead articles used in the plumbing trade, such as lead traps, lead pipe, lead lining of tubs, or sinks for laboratories, and lead service and waste pipes. In modern plumbing work, less lead is used than formerly, as cast and wrought iron pipes and brass tubing are taking its place.

The Production and Uses of Tungsten

By N. A. Rousselot, '17.

In former years the mineral "tungsten" was mistaken for tin ore, until the truth was discovered by a Swedish chemist in 1781. He proved that scheelite, calcium tungstate, contained a peculiar acid, which he called Tungstic acid. Tungsten has not, however, come into use until the last ten or fifteen years.

It is found principally in four different forms: wolframite, hubnerite, ferberite, and scheelite. Wolframite is an iron and manganese tungstate. It is a brownish black substance, and when pure contains about 76 per cent of tungsten trioxide.

Hubnerite, named after a German chemist, Dr. Hubner, who first analyzed it, is a manganese tungstate. Its color varies from a red brown to a black, and from a yellow to a greenish grey.

Scheelite, calcium tungstate, is found as a yellow, brownish red, and pure white mineral.

Ferberite is a black iron tungstate. This mineral is found mixed with manganese and iron oxide, which colorizes it.

The principal deposits of tungsten are found in Colorado and Burma, Asia. In the United States tungsten is found most extensively in the West, California being second to Colorado in its production. The United States produces about one-eighth of the world's output, while Burma produces one-fifth; however, tungsten deposits are found in nearly all parts of the world.

The tungsten from Colorado is chiefly ferberite; however, a great deal of wolframite has been produced lately. The deposits of tungsten are found in the country called the Boulder tungsten fields.

In former years all the tungsten ore was sent to Germany to be refined, but since the war a small plant has been installed in Colorado to refine the ore. The ore is roasted with sodium carbonate (soda ash) on a hearth after it has been ground with flint pebbles. Precautions are taken to secure a high percentage of soluble sodium tungstate. The roasted mixture is then transferred to vats where it is leached out with hot water. The mixture passes through a vacuum filter which separates the water from the slime; then, by the addition of hydrochloric acid, tungsten trioxide is precipitated from the solution by decantation. The trioxide is then reduced to metallic tungsten by heating with charcoal. After this process it is moistened and compressed; then it is put into an electric furnace where it is sintered. It is then drawn out to any desired thickness.

Tungsten can be made into the finest wire known. The tensile strength is around 600,000 pounds per square inch, while that of steel wire is only 300,000 pounds. It is a very hard substance yet malleable. It is insoluble in all the common acids, but it is readily soluble in a mixture of nitric and hydrofluoric acids.

Tungsten is used as an alloy of high-speed steel. The steel is put in the bottom of pots and the tungsten placed on top. The mixture is heated to about 1000° C., when the tungsten readily combines with the steel, although the boiling point of tungsten is about 3700° C. The steel is melted and then "killed" in the crucibles by being held in the furnace for thirty or forty minutes after the charge has melted, until the steel ceases to bubble and lies dead in the pot.

The steel that is used for high-speed lathe work contains about two per cent of tungsten. A tungsten steel is also used in magnets, saw blades, and projectiles.

A great deal of tungsten is consumed in the manufacture of incandescent lamps. This wire is the thinnest known, yet is not easily broken. The lights used to be very fragile, but lately the wire has been perfected until now they are comparatively unbreakable. The tungsten light consumes only 0.81 watt per candle power, while the carbon filament lights consume 3.55 watts. The tungsten light gives a white light which the carbon light cannot produce.

Tungsten has many other important uses, but they do not consume an appreciable amount of it. The most important of these, probably, is the X-ray target. On account of its peculiar properties and durability, tungsten cannot be equaled for this use, so it is rapidly taking the place of platinum, which is objectionable on account of its high price.

Dynamo Electric Machinery

By R. B. Lohry, '16.

PHYSICAL THEORY

In fig. 1 a rectangular coil of wire is placed in the center of a uniform field with its plane lying perpendicular to the lines of force; in this position, the coil encloses the greatest number of lines of force. A voltmeter *VM* for measuring small electromotive forces is connected to the two ends of the coil, as per diagram. The circuit in the voltmeter is kept closed and any electromotive force generated in the conductor will be indicated by the deflection of the voltmeter needle. So long as the coil remains at rest in the magnetic field no electromotive force will be generated; but imagine the coil to be rotated on an axis in its own plane *mn*, represented by the broken line, in the direction indicated by the curved arrows. As the coil starts to rotate, its sides *cd* and *ef* begin to cut the lines of force at right angles, thus generating an electromotive force in each side. From the thumb-and-finger rule, the electromotive force generated in the upper side tends to cause a current to flow from *f* to *e*; and in the lower side to flow from *d* to *c*. Hence, the E. M. F.'s generated in the two sides are added together, and the total E. M. F. generated in the coil is indicated by the voltmeter *VM* between *a* and *b*, the end *b* forming the positive terminal of the coil. If the coil is rotated at a uniform angular velocity, that is, if the speed of rotation is constant throughout each revolution, the deflection of the voltmeter becomes greater as the coil revolves from its vertical position until it passes through one-quarter of a revolution and reaches a position where its plane lies parallel to the lines of force. In the same figure, indicated by dotted lines, is the coil after having passed one-quarter revolution. The deflection of the needle, if read at frequent intervals

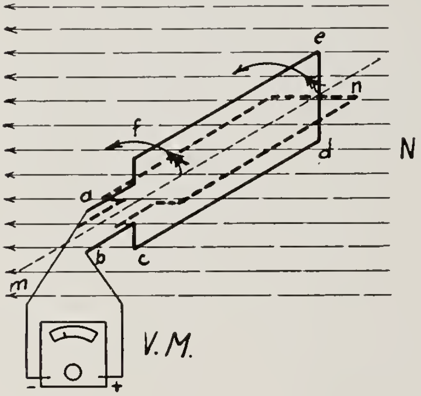


Fig. 1.

during this quarter of a revolution, gradually increases, beginning at zero, as indicated by the solid coil, and reaching maximum, indicated by the dotted coil. After the coil leaves the dotted position the E. M. F. that is being generated begins to diminish, and by the time the coil has revolved one-half revolution and is once more in the vertical position, the E. M. F. falls to zero again.

As soon as the coil starts on the last half of the revolution, its sides *cd* and *ef* cut a few lines of force and consequently an E. M. F. is generated in each side. The E. M. F., however, tends to flow in the coil in an opposite direction to that which tends to flow in the first half of the revolution. For, by applying the thumb-and-finger rule, the E. M. F. generated in the sides tends to flow from *c* to *d* and from *e* to *f*; the end of the coil *a*, which in the first half of the revolution was the negative terminal, is now the positive terminal. Hence, in order to allow the current to enter the positive post of the voltmeter *VM*, the connections must be reversed. The E. M. F. that is generated rises from zero to maximum and then to zero each half revolution, the E. M. F. falling to zero when parallel to the lines of force.

In fig. 2 suppose that the ends of the circuit are not connected directly to the coil ends, but to brushes *r* and *s* which bear upon two collector rings *x* and *y*. These collector rings, it will be seen, are connected to the coil ends *a* and *b* respectively. The resistance of the entire circuit, including brushes, collector rings, coil, ammeter, is comparatively small; hence, any E. M. F. generated in the coil tends to send a corresponding current through the circuit, the strength of which is indicated by the ammeter *AM*.

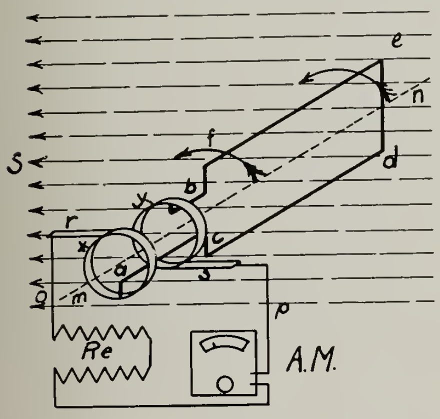


Fig. 2.

When the coil begins to revolve, a feeble E. M. F. is generated and causes a corresponding current to flow through the circuit in a positive direction. As the E. M. F. becomes greater, the corresponding current becomes greater, and vice versa. After the coil is rotated one-half revolution the E. M. F. is reversed and becomes negative, also the current becomes negative, for the remaining half revolution. Revolving the coil, therefore, at constant speed generates a current in the circuit, which, in every revolution, rises gradually to maximum strength and falls to zero in one direction, then is reversed, and the same effect is again produced, but in an opposite direction.

In other words, the current in the circuit alternates from one direction to the opposite direction. An electric current of this character is termed an alternating current.

The next step is to demonstrate the principle of changing or commuting this alternating current into a continuous or direct current; that is, a current which always flows in the same direction through the external circuit. In fig. 3 the two ends of the coil are connected to two halves *s* and *s'* of a metallic tube. These halves are called segments and in this case are separated by air, the rigidity of the coil holding them apart. The combination of these segments is called a commutator. Two copper strips $+B$ and $-B$, called brushes, press against the segments; and are held in a horizontal position while the coil is rotated. The brushes rub or brush against the segments, thus making the electrical contact only.

When the coil is in a vertical position, as shown, the brushes bear on both segments, but as the coil starts on the first half revolution brush —*B* leaves segment *s*′ and rubs only on *s*; brush +*B* leaves segment *s* and rubs only on *s*′. As previously described, the E. M. F. generated is flowing from +*B* and entering at —*B*. On the last half revolution the current is still leaving as above indicated, while the E. M. F. in the coil has reversed but is still flowing from brush +*B*. At the beginning of the last half of the revolution, end *a* of the coil becomes positive, —*B* leaves segment *s* and makes contact with *s*′ and +*B* leaves *s*′ and makes contact with *s*. Hence the current in the external circuit during a complete revolution flows in one direction, while the current in the coil itself flows in two directions every revolution. But the strength of the current in the external circuit is by no means constant; it rises from zero to maximum strength and falls again to zero twice every revolution, but always in the same direction. This is the pulsating direct current.

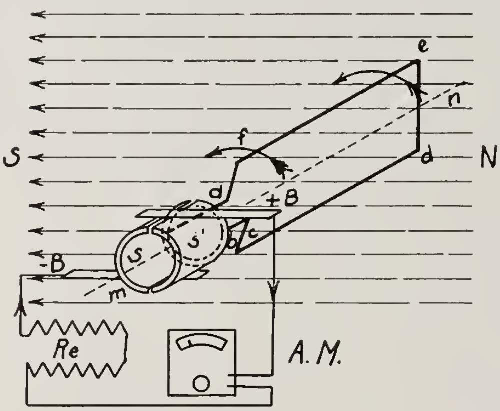


Fig. 3.

The foregoing principles are those of all machinery for the conversion of mechanical energy into electrical energy. There are two principal types of generators now on the market; namely, A. C. and D. C. machines. Of these two types D. C. machinery was the first to be developed because of the unknown properties and applications of the alternating current at that time. The alternating current generator has now been perfected to a high degree and is taking the place of many D. C. generators. Although D. C. machinery is used to great extent in railroading and short-distance transmission, A. C. machinery is used for long-distance transmission with greater efficiency than with D. C. machinery.

Machinery of both types have been built in very large sizes. For instance, a large D. C. generator recently built delivered 10,000 Kw., which means a saving in space of many smaller units. Also a large turbo generator has been built producing 30,000 Kw., thus showing the almost unlimited size to which electro-dynamic machinery may be built.

The Manufacture of Grinding Wheels

By Richard Aaron, '16.

Grinding wheels are made by three processes, namely, vitrified, silicate or semi-vitrified, and elastic. The surface of the wheels made by the first of these processes is the finest and the others are respectively coarser. The wheels are manufactured in a great variety of shapes and sizes, to suit all classes of grinding. Among the abrasive materials from which they are made are emery, corundum, carborundum, alundum, crystolon, carbolite and carbonite. These substances vary in hardness, but it is not always the hardest grit that is the best for cutting purposes, as may generally be supposed. The shape and form of the fracture of the particles from which the wheel is made play a very important part. This can be readily shown by imagining a wheel made up of diamonds, the hardest substance known, and imagining each small diamond, or particle of the wheel, to be spherical in shape; it is quite obvious that the wheel would be of little value for grinding. Now, on the other hand if the particles were crystalline or conchoidal, that is curved or shell-like in structure, we would have an ideal grinding wheel.

The substances already named, that are used for grinding purposes, are both natural and manufactured. Emery and corundum are both mined; corundum being an oxide of aluminum varying in purity according to the neighborhood in which it is found, while emery is a form of corundum with a varying per cent of impurities. These both are of a tough consistency breaking with a conchoidal fracture, and, in the case of the emery, very often with a crystalline fracture.

Carborundum, alundum, crystolon, carbolite and carbonite are all manufactured. Carborundum is the name given to carbide of silicon as manufactured in the electric furnace by the Carborundum Company. The principal materials entering into its manufacture are coke and sand, the former supplying the carbon and the latter the silicon. The coke and sand are raised to a very high temperature which destroys everything except the carbon and silicon, and finally the atoms of these two substances unite to form carborundum, a material which breaks with a sharp crystalline fracture.

Alundum is a very pure material, having only about 2 per cent or less impurities, being very tough and having a sharp conchoidal fracture. It is a fused oxide of alumina, being made in an electric furnace from a mineral called bauxite.

Crystolon, another of the materials used for grinding wheels, like alundum is a product of the electric furnace, being carbide of silicon, and one of the newest materials put on the market for grinding purposes. One of its characteristic properties is its brittleness, which makes it effective for grinding such metals as cast iron and brass and also marble, granite, and in fact any material with a low tensile strength.

Carbolite, another carbide of silicon product from the electric furnace, is also greatly used for grinding soft materials such as cast iron and brass, while carbonite, a similar product, is used for much the same purpose.

The manufacture of grinding wheels from the various materials is rather a simple process. In the making of the vitrified wheels no pressing or tamping whatever is done. The abrasive, or cutting material, together with the bond, that is the material which cements or holds the cutting particles together, is put into power-mixing kettles with sufficient water to form a plastic mass. After this is sufficiently mixed it is poured off into forming rings or moulds of the required sizes, and then put into dry rooms. After drying for some time the crude wheels are removed from the forms and reduced to the approximate sizes of the finished wheels on shaving machines. The wheels are then again placed in dry rooms, where they are allowed to thoroughly dry out. After leaving these rooms they are placed in large ovens known as kilns and are subjected to a very high temperature, that is almost 3000°F., this causing the bond, which is holding together the cutting particles, to fuse and vitrify. The wheels remain here all the way from 6 to 20 days, depending on the size of the oven.

The wheels now go to the truing department where they are reduced to size, faced off, and made to run perfectly true. They are now ready for the grading room, where, after being graded, they are tested and inspected before being put upon the market.

In testing the different wheels they are run on a testing machine at a peripheral speed of at least 9000 feet per minute, that is, the circumference is traveling at this rate, giving a stress of about 250 pounds per square inch.

This speed is from 50 to 100 per cent higher than that at which the wheel is operated in practice, and the stresses produced are two or three times as high as when run at the normal speed. Under this test a wheel will break if it is defective.

The vitrified process, which has just been explained, produces open texture, free-cutting grinding wheels, which are not affected by weather, time, water, oils, acids, or soda, and are used for both wet and dry grinding.

Silicate wheels are made by the tamping process. The bond is mixed with the abrasive material and alundum by machinery, and while it is in a plastic state it is poured into iron moulds and tamped. The wheels are then placed in drying ovens, and after being left here for a short time they are sent to the truing department, where they go through the same processes as the vitrified wheels.

By the silicate process wheels are made of larger diameters and greater thickness than any other method. They are made either with or without a wire web which runs through them parallel to the faces. Some prefer this web where very severe grinding is to be done, while others disapprove of its use as not being essential. The wheels made by the silicate process are water-proof, therefore being serviceable for either wet or dry grinding.

The only grinding wheels that are made very thin, and yet have the necessary strength and elasticity to make them durable, are the wheels manufactured by the elastic process. These wheels are bonded by gums, such as rubber, shellac and resins, the bond and abrasive material being heated and pressed in moulds. By this process wheels are made as thin as 1/32 inch up to 4 inches diameter; 1/16 inch up to 10 inches diameter; 1/8 inch up to 12 inches diameter. Wheels of small diameters have been made as thin as 1/64 inch.

The thin grinding wheels made by the elastic process are used mostly for such jobs as grinding between the teeth of gears, sharpening moulding cutters and woodwork tools, cutting off small stock such as thin strips, tubing and wire, and for slotting and roll grinding. They may be run in water, caustic soda or dry.

Grinding wheels are now entering so largely into our industrial arts that they are of the utmost importance in all shops and factories, as can be readily noticed in our own shops. There are many peculiar phenomena which take place in the action of abrasive materials that are difficult to account for, and there are still opportunities for some to make interesting and useful research, in an unending effort to make better grinding wheels.

LUX WORK BASKET

Velvet

By Viola Nordman, '16.

Velvet has always and justly been regarded as the most beautiful of textiles. No matter how fashions change in regard to other materials, velvet never loses its vogue. For robes and cloaks, for mantles and jackets, for hats and bonnets, for trimming and decoration, velvet has been perennially popular, but never before has it been so cheap, so varied, so beautiful as it is now. One can, in the passing throng of pedestrians on any crowded street see the use and abuse of this noble material. There is scarcely an article of dress into whose composition it does not enter, and it is worn upon all occasions. Many things have brought about this result. The tendency of fashion is towards the decorative and picturesque, and in these qualities velvet excels all fabrics. Silk waste and thread are cheaper than ever before so that velvet costs much less than formerly. The men behind the looms have evolved more designs and novelties in the making of velvet than has ever been known, and colors beautiful in themselves are seemingly enhanced when applied to velvet.

All that has been said in favor of velvet applies equally to velveteen; in fact, it is a textile of even greater vogue and beauty than velvet. The best grades are not cheap, but they wear better than silk velvet, are fine and silky, excellent in color and sheen, launder well and do not press-mark as does silk velvet. Velveteen takes the dye so well that it ranks with our best standard fabrics. It is made entirely of cotton and varies in width, but is always wider than velvet.

Velvet is a silken textile fabric having a soft dense pile surface. In all probability the art of velvet weaving originated in the Far East, and it is not until the beginning of the fifteenth century that we find any mention of the textile. The word appears for the first time in an act of Henry IV, A. D. 1403, in which it is ordered, that no man not being a banneret, a person of higher estate, shall wear any cloth of gold, of crimson, of velvet or motley velvet. After that period, the mention of velvet is frequent, and during the fifteenth and sixteenth centuries it was worn to a considerable extent by persons of condition of both sexes, and has continued in high estimation to the present day.

The peculiar properties of velvet, the splendid yet softened depths of dye colour it exhibited, at once marked it as a fit material for ecclesiastical vestments, royal and state robes, and sumptuous hangings; and the most magnificent textures of medieval times were Italian velvets. These were in many ways most effectively treated for ornamentation, such as by varying the colour of pile, by producing pile of different lengths (pile upon pile, or double pile), and by brocading with plain silk, with uncut pile or with a ground of gold tissue. The earliest sources of European artistic velvets were Lucca, Genoa, Florence and Venice, and to the present day Genoa continues to send out rich velvet textures.

The manufacture of pile fabrics, to which velvet belongs, are textures woven with a looped or otherwise raised surface. Looped pile is any fabric in which the loops remain uncut, as in Brussels and tapestry carpets and terry velvets. When these loops are cut in the finished texture, the material is a cut pile, such as ordinary velvet, fustian, imitation sealskin and other imitation furs.

For ordinary loop and cut pile fabrics two warps are required, the regular beam warp and the pole or pile warp. The latter, being raised in loops, is worked up more rapidly than the ordinary warp and consequently it has to be of greater length and wound on a separate beam. The ground or foundation of the velvet may be either a plain or a twilled texture, and after every third pick, or weft, a wire is introduced into the shed and beaten up and woven into the cloth. In this way, by the stretching of the pile warp over the wire, a row of loops is formed across the web, the size of the loops being regulated by the size of the wire. If a looped pile is being woven, then it only remains to pull out the wires from behind and again weave them in front as the work proceeds. But if cut pile is being made, then either the loops must be cut along the top before the wire is withdrawn, or the wire may at one end be provided with a knife edge which itself cuts the loops as it is being pulled out. For velvets the wires are provided with a groove on their upper face, and along this groove a cutting knife, called a trivet, is run to cut the loops.

The third method of weaving pile consists of making a double web, the pile warp passing from one to the other and binding them together. When the connecting threads are cut they form a pile surface for each separate cloth. The great difficulty in perfecting this method has been to keep the connecting pile equal in length throughout and to cut it so as to produce uniform level surfaces. The success which has been attained in plush weaving with double-cloth is largely due to the patient and well directed efforts of Mr. S. C. Rister of Manning, Bradford.

Velveteen is an imitation of velvet. The term is sometimes applied to a mixture of silk and cotton. Some velveteens are a kind of fustian, having a rib of velvet pile alternating with a plain depression. Velveteens are commonly woven on sheeting looms, and manufacturers are able to alternate the two kinds of goods according to the demand.

Linen

By Marion Robinson, '17.

Linen is a cloth made of flax and differing from that made of hemp only in fineness. The word, "linen," is derived from the old Anglo-Saxon meaning flax. It is usually made with the warp and woof crossing each other at right angles. The beauty of the cloth consists of an evenness of thread and the fineness and density of the thread.

The use of flax is more general than any other known fiber. It was cultivated and cloth manufactured from it by the early Swiss Lake Dwellers. Among the ancient Egyptians, Chaldeans and Babylonians its use was carried to a high state of perfection. Linen clothing and books were used by the Greeks and Romans. Linen robes were used by the Jewish priests in earliest times. And in our own country the cultivation of flax was brought by the first settlers.

The flax plant grows to a height of about two feet. It has green leaves and light blue flowers. The plant is very slender. A moist and fertile soil is required for its cultivation. While it is growing the plants must be kept free from weeds.

Flax is harvested by pulling it up by the roots. It is then stacked and dried. After drying it is retted. This is a process of softening the fiber by water. In some countries the flax is left in the fields over night and retted by the dew. This is not a very good process and makes a poorer linen. Sometimes it is soaked in pools of water. The best results are obtained by using running water.

In the manufacture, the straw is first passed through a breaker which loosens the woody part of the stem. The crushing process whips out all but the fiber. After this it is combed. These combings produce tow and the more frequent the combings the greater the cost of the material. This process is known as hackling.

Two kinds of thread are used in linen, the flat and rolled. As the beauty of linen lies in its density, the rolled thread is much preferred. Besides this classification it is graded commercially. Different countries and different localities in countries produce different grades.

In the production of fine linen, Ireland, Belgium and Holland rank first. Canada and Russia produce the next quality. Mexico produces very good linen and has many linen factories. In the United States flax is produced for thread, twine and crash toweling. Very little fine linen is made in this country.

SCHOOL NOTES

Lux Rallies

The Christmas Rally at Lux was decidedly a success. The various classes assembled in the living-room and were called to order promptly at 10:30 by President Florence Winter.

Miss Otto then spoke a few encouraging words, congratulating the school as a whole upon the great achievements of the term and urging that the same spirit be demonstrated in the coming year.

The initial appearance of the Lux Stringed Orchestra was greeted as a joy by everyone. Surely Miss Woll and Miss Lightbody must be gratified at the outcome of their untiring efforts, for the orchestra in every sense of the word is splendid.

A duet beautifully sung by Miss Jessie Easton and Miss Gertrude Arnold was then enjoyed and appreciated heartily. Miss Ruth Carson also delighted her hearers with a Christmas song.

A reading of one of James Whitcomb Riley's Christmas poems brought tears and laughter almost simultaneously. The reader, so in sympathy with the selection, was Miss Azalea Rivers.

Miss Frances De Vere, she of the ever-ready wit, neatly and concisely summed up the term's events, which proved the semester's work entirely satisfactory. Miss De Vere was certainly capable of handling this summary, for she is represented in almost every one of the Lux activities and therefore was thoroughly acquainted with every happening.

The awarding of the Lux numerals, to the members of the Basket-Ball and Debating Teams, was then in order. The victors received their honors happily, yet reverently, while the school sang the Victor's Ode.

The rally closed with the singing of a beautiful Christmas hymn by the entire assembly.

Lectures

A great number of important and interesting lectures have been given in the Lux Seminar during the last quarter and have proved valuable to all.

The first was delivered by Mrs. Denniston, February 3. Her subject was "The Needlework Guild of America."

On February 10 Miss Mary Edwards entertained the classes by "The Story of the Universe," which was so appreciated that we are looking forward to another.

Miss Foster, on the afternoon of February 17, lectured on the "Welfare Work for Girls in the Emporium Department Store."

From Miss Julia Edwards we have derived a store of knowledge concerning the "Berea School of Kentucky," for such was her theme on

February 24. Her talk was full of human heart interest, and we want to know even more of the splendid work being carried on.

On February 25, Mr. S. A. Tibbetts delivered a lecture on the "Properties and Chemistry of Jewels." This was the last lecture recorded, but we are looking forward with pleasant anticipations to the promised talk of Dr. G. H. Richardson concerning "Red Cross Work," to be given March 2.

The Senior Vaudeville Show

One of the greatest events of the past semester was the "Select Vodavil Show" given by the Senior Class in honor of the Christmas Graduating Class, and the Lux Sophomore, Senior, and Normal girls. The show was the first one of its kind to be given at the school, and for this reason its brilliant success was all the more noteworthy. Much praise is due Mr. Cahen, whose whole-hearted labors and splendid management made the production what it was. Also every member of the various committees and the stage managers are to be commended on their good work.

Sharply at 2:15, on the last Wednesday of the term, "Sam Faverman's Aggravated Hungry Orchestra" struck up the opening selection.

At its close, "Johnny" Gavin, the "Sweet Swedish Songster," rendered a few delightful solos.

Next "Pappas' Royal Lunch Grabbers' Quintette," composed of Messrs. Dehm, Benninger, Klinger, Delius, and Faverman, under the direct leadership of Mr. Hansell, sang a number of very harmonious (?) songs, ending with the "Lick-Wilmerding Hymn."

"Santa Claus" now slowly came up the aisle, bearing his heavy sack of presents. Mounting the stage, he began to distribute some very useful articles, such as toy meat-choppers, carpet-sweepers, and coffee-mills to those members of the Graduating Class and the officers of the Lux Sophomore, Senior, and Normal Classes who he deemed would find use for them. This done, he wished the assembly a "Merry Christmas" and departed for his North Polar abode.

Following another selection from the Hungry Orchestra, Lawrence Anderson and Bert Wilbrand, the famous would-be comedians, entertained the audience with a little sketch entitled "Fun in a Chemistry Shop."

When the curtain again arose Ali Rajah and his assistant, Ooka Czarovitch, were revealed on the stage. These two famous personages performed a "Marvelous Mind Reading Act," in which all the wonders of mental telepathy were employed. This act was a great success—completely baffling the audience.

The "stunts" for the day were concluded by Mlle. Celene Sheldon, the world-famed prima donna from Alameda's Royal Opera House, who sang some delightful melodies to the accompaniment of her ukulele.

Following the show the floor was cleared for dancing. After a number of very enjoyable dances, the party ended, and everybody set out for home with the idea that the afternoon had been a splendid success in every respect.

The Christmas Commencement Rally

The consummation of the spirit shown during the last semester was reached in the Commencement Rally, which went off with such "pep" and "go" as only a successful rally could.

The Seniors upheld their reputation for spirit by marching in at the last minute wearing moustaches (imitations, of course) and dressed up in old clothes. This performance lent just enough humor to the rally to keep everyone good-natured.

After an opening selection from the orchestra, Mr. Heymann mounted the platform and in a few words reviewed the accomplishments of the semester.

Next we heard from Captain Buckley and Manager Faverman—the two men to whom our hard work in football is indebted.

The deep regard that the team holds for Buckley was shown in the speech of LeGal, captain-elect of next year's team.

The "Marching Song," sung by the Boys' Chorus, under the leadership of Mr. Hansell, brought a new activity into prominence from which much is expected in the future.

Following this commendable demonstration, the L.-W.-L. D. S., the Radio Club, and the Alumni were represented by Thacher, Clark and P. Heyneman, respectively.

Cahen and Faverman now favored us with their famous Rajah Act from the Senior Vaudeville Show. This made a great hit with the entire Student Body—nobody being able to guess how it was done.

Next "Frenchy" Sassus informed us of the condition of the "Life"; while "Andy" Mains and Aaron told of the things that the Camera Club and Orchestra had performed.

Mr. Wood commented on the successful union of the two schools and showed his appreciation of our efforts to make it so.

Mr. Stemas was now called onto the platform and given a gold stick-pin by Buckley in behalf of the '16 Class, to show their regard for the services he had rendered them. Stemas wished the whole school a "Merry Christmas" and then hastily departed.

Block L.-W.'s were presented to Jacobs and Midgely, for their track prowess, by President Gavin, while the whole Student Body sang the "Victor's Ode."

The installation of the Student Body officers for the next semester followed, "Pop" Banfield, Corwin, and "Doc" Anderson being installed as president, vice-president, and yell-leader, respectively. President Gavin then turned the rally over to Banfield, who gave a fine speech on what we should strive to attain during the next six months.

After a selection from the orchestra and the "Lick-Wilmerding Hymn" from the Boys' Chorus, the rally ended with a mighty Alibebo.

The Wilmerding Founder's Day

Since the joining of the student bodies—Lick and Wilmerding—two Founder's Days are still observed, one being the day on which James Lick founded the Lick School, and the other when Mr. Wilmerding founded the Wilmerding School. The former comes on the 21st of September and the latter on the 8th of February.

At eleven o'clock, the whistle summoned everybody from their respective classes to gather in the assembly room in the Wilmerding Building.

The exercises opened with a selection from the Orchestra, which went off in a manner to be proud of.

After this, Mr. Merrill rose and gave a brief summary of the life of Mr. Wilmerding and the events which induced him to found an industrial school. Mr. Merrill then introduced, as speaker of the day, Mr. Faville, the well-known San Francisco architect who was one of the board of three prominent architects who decided on the original plans of the Fair.

The theme of Mr. Faville's address was "Co-operation." Co-operation is, as he stated it, the keynote of success. The great Panama-Pacific Exposition was made such a wonderful success through the co-operation of the architects, who designed it, of the artists, sculptors, and builders who put their plans into effect, and of the people of San Francisco, who so loyally supported it after its completion. As in the building of the Fair, co-operation is the most important factor in everything we attempt, in school or out in the world. Co-operation and concentration of our thoughts are what at last yield inspiration—the top rung of the ladder of success.

The favor which Mr. Faville's speech received was evidenced by the whole-hearted applause which followed it.

Mr. Merrill then gave special notice of the recent deaths that have occurred in our midst, especially the death of Mr. Grant, who had been a teacher in the Wilmerding School since its erection. He also expressed his regrets on the unavoidable absence of the trustees, and extended his thanks to Mrs. Hallidie for her attendance.

After two more selections from the orchestra, the memorable observances closed with the "Lick-Wilmerding Hymn," sung by the whole Student Body.

L.-W.-L. D. S.

This term the Debating Society promises to be a busy organization. There is, first, the debate with Humboldt, to take place Saturday evening, March 11. The Lick-Wilmerding team has shown its worth and intends to put up a strong argument for the affirmative of the question: "Resolved, That the United States should enter into an alliance with the republics of North and South America for the protection of their mutual interests." The winning team of this debate is to debate Lowell for the championship, April 22. Give them your support. They have earned it in the past; the coming debates need it.

On April 29 the Debating League of California will hold its semi-annual convention at Lux. The L.-W.-L.- D. S. will act as hosts. Here again is a chance to show the true spirit of the L.-W.-L. Let us then work together and make those who attend the convention feel the warmth of the Lick, Wilmerding and Lux hospitality.

Camera Club Notes

The Camera Club has started out with fine prospects for a successful semester. At the first meeting Mains was re-elected president; Paoline was elected vice-president; Casper, secretary, and Young, treasurer. With Hermes as dues extractor, the financial success of the club is assured.

Through the kind efforts of Mr. Williams the small enlarging camera has been put into first-class condition and much satisfactory work is being turned out.

The club already has the plans well under way for the big event of the year—the annual competition. This affair is to be held in the freehand drawing room at Lick, on Friday afternoon, April 28.

No effort is being spared to make the afternoon one of interest and pleasure to all. There will be the usual competition, open to the faculty and students of Lick, Wilmerding and Lux. Several valuable prizes will be awarded. Besides this there will be an exhibition of photographs of general interest including the work of some of the well-known professionals. Arrangements are being made to have some photographer give an illustrated lecture. The remainder of the afternoon will be devoted to dancing and refreshments.

Rufus Milan Grant

Mr. Rufus M. Grant, instructor of carpentry in the Wilmerding School, died January 29, 1916. On Friday, the 28th, he attended to his customary duties, appearing to be in his usual good health. Before midnight he was taken seriously ill and the following morning submitted to an operation, from which he failed to rally, passing away during the afternoon without recovering consciousness.

Mr. Grant was the pioneer teacher of the Wilmerding faculty. He superintended the construction of the first building, and was placed in charge of the department of carpentry when the school was opened, in January, 1900.

He was born June 14, 1848, and spent his boyhood on the coast of Maine. As a young man he learned the trade of stair building and worked at that trade in the city of Boston, Mass., until 1875, when he came to California. For a quarter century thereafter he engaged in contracting and building, in San Francisco and in Alameda county. As a mechanic, he was skillful in the highest degree. As an individual, he had an abundance of the qualities that mark a sturdy manhood, and withal was possessed of a cheerful, kindly temperament and a whole-souled personality that made the world seem better for his presence, and makes all of us regretful of his departure.

In Memoriam

John Trumbull

Class of 1917. Died January 16, 1916

On the third of August, 1913, John Trumbull entered Lick as a member of the 1917 class. He was somewhat handicapped by poor health during his freshman year, but with the spirit which characterized all his actions he entered bravely and energetically into all the activities of the school. He gained note as an athlete and by the latter part of his sophomore year he was on the threshold of a promising high school career. In the fall of 1915 he was injured while playing football, but recovered from this injury and again took up his duties in school. Early in January of the present year, with the resolution and energy of the New Year full upon him, he fell a victim to the dread disease pneumonia.

John Trumbull was the only son of a widowed mother, and to her we extend our deepest sympathy in her sorrow. We can say of him that his influence among us was good and we sadly miss his generous heart and cheerful spirit from our midst.

Because in life he met all his duties and responsibilities faithfully and cheerfully, let us think of his meeting death, not with fear and misgivings, but with the spirit of the poet who said:

"I have got my leave. Bid me farewell, my brothers. I take my departure. Here I give back the keys of my door and I give up all claims to my house. I only ask for last kind words from you. We were neighbors for long, but now the day has dawned and the lamp that lit my dark corner is out. A summons has come and I am ready for my journey. The sky is flushed with the dawn and my path lies beautiful."

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EDITORIALS

Outsiders and also many students of the L.-W.-L. have not been able to familiarize themselves with certain portions of our school government. The L.-W.-L. is considered a unit only as far as student control is concerned. The schools are endowed by three separate persons, and as such they cannot be legally combined. But to create a spirit of unity in student control, the boys' schools, Lick and Wilmerding, were combined in their various classes, teams and societies. The girls' school, Lux, first became a part of the alliance through the amalgamation of the organizations involving the three schools. The second and more important step of the combination occurred when the Lick, Wilmerding and Lux student bodies agreed to act as a unit in the publication of the school organ, the L.-W.-L. Life. This book represents the amalgamation of the "Lux Journal," the Lick "Tiger" and the "Wilmerding Life." For the benefit of many inquirers we will state that the student bodies are contributing towards the support of the paper a sum equal to twenty-five cents for each student. Any amount above this required to defray publishing expenses is paid for by the board of trustees. In this manner our paper is supported without ads.

The orchestra demonstrated its musical talent on Founder's Day (Wilmerding) and the reception it received easily placed it among the most popular of musical organizations of the schools. In order to have a real insight of its value we must take the following facts into consideration. The members have provided music at the different rallies and at the majority of the school socials. The orchestras in some high schools are paid to perform this work; our school orchestra draws money only for sheet music. Thus we can readily see that this orchestra that serves the student body in a spirit of loyalty is a real asset to the students.

In this number of the L.-W.-L. Life we have changed the material usually appearing under the heads of Shop Notes and Lux Work Basket. In our first two issues, this space was devoted to accounts concerning the work performed in the shops and the students doing this work. However, we soon realized that these departments were developing into monotonous repetitions, the only apparent changes being the new names of students. For this reason, and many more that we cannot enumerate, we made our decision to eliminate Shop Notes and the Lux Work Basket and provide in their stead a department that would be interesting and, primarily, instructive. By substituting technical articles for the old-fashioned notes we think that the problem has been dealt with in a manner that will meet with general approval. We would like to make one suggestion in regard to this new work and that is, make your article deal with some subject you may be taking in shop. In this manner you have the benefit of your instructor's supervision, and your article may prove to be both instructive and interesting to the entire student body. A second reason, though it may appeal to many students in a different light, is the providing of a new field for L.-W.-L. Life stories. For those who have not the literary ability or the imaginative powers required to write fiction, this change should provide a boon.

COMMENTS ON OUR EXCHANGES

The Bulletin, December, 1915, Huntington Park High School, Huntington Park, California.—Your paper is a very neatly arranged book, and its contents are interesting. The fact that it is printed at the school adds to the reader's interest. "The Diary of a Movie Actress" is interesting, as is "The Junior College," which gives the reader a good idea of your school, although it really should be classed under school notes and not under the literary department.

The High School Herald, December, 1915, Westfield High School, Westfield, Massachusetts.—You have no need to worry along literary lines, for "Her Christmas," helped by "An Uninvited Guest" and "Retaliation" form one of our best exchange literary departments. Your literary department is appropriate to the season, most of your stories conforming to the Christmas spirit. Your school notes and athletic departments are well worked, and your large joke department rounds out a fine paper. One thing which would greatly improve your paper is a change in cuts and cover design.

The Ocksheperida, October, 1915, Sheridan High School, Sheridan, Wyoming.—Your lone story, "Silver," is a fine one, but if it were supported by more of a like caliber, it would greatly improve your book. A few cuts, also, would improve it. Your school notes and alumni notes make up for the omission of literary and art work.

The Spy, Thanksgiving Number, 1915, Kenosha High School, Kenosha, Wisconsin.—If you would abolish your first page of ads and substitute for it a table of contents, you would be making a change for the better. Your various Thanksgivings, "Suffrage," "Movie," and "Rastus," make your paper an ideal Thanksgiving number. What sketches you have are good.

T. C. A. Chronicle, November, 1915, Troy Conference Academy, Poultney, Vermont.—Your paper is, as usual, welcome, interesting, and neat. "The White Feather" and "A Scrape" are good stories, while your book is, as always, well arranged.

The Columbian, June, 1915, and December, 1915, South Orange High School, South Orange, New Jersey.—"A Trip to Mars," though often written of, is here treated originally, and "The Fisher Wife" is a very good sketch. Athletics and school notes in both issues are well done.

The Hesperian, November, 1915, Oregon City High School, Oregon City, Oregon.—In your department of exchanges, we see a suggestion of a "Fair Number." We published such a number in March, 1915. As for your book, it shows the spirit of Thanksgiving throughout. "Ku-Ze-Ku-Kas' Thanksgiving Dinner" and "A Thankful Day" are the shining lights of your literary department.

The Review, November and December, 1915, Lowell High School, Lowell, Massachusetts.—Another Massachusetts exchange, and every bit as good as the others. "Whose Cucumbers?" and "When Curtis Saved the Game" in the November issue are very fine stories, as are "Caught Masquerading" and "The Letter." The former is one of the best stories we have read. The notes in both issues are interesting and complete.

The Piquonian, November, 1915, Piqua, Ohio.—"Turkey, Pumpkin, Mince Pie" is a good story and should be supported by more. Why not collect your jokes and put them in one separate department? Your school notes and athletics need no improvement.

The Shueis, December, 1915, Schenectady, New York.—Although both "A Tale of Christmastide" and "The Old House" are good stories, don't you think the addition of a few more would greatly improve your paper? Your "frat" page would indicate that you had plenty of room.

The Quill, East High School, Des Moines, Iowa.—Your "quill" does splendid work. More cuts always improve a paper. Next time omit a little of *Bruce Gould;* too much of one man spoils a paper.

College Review, Saint Andrew's College, Toronto, Canada.—Your paper cannot be praised enough. The personal news from the battlefield brings home, to us, the horrors of war as no mere newspaper can do. Your jokes are fine.

Sequoia, Sequoia Union High School, Redwood City, California.—"The Quitter" is a story true to life written by an artist's hand. Make your art staff hustle for the next issue. Remember, we would like to see it.

The Red Man, Carlisle Institute, Carlisle, Pennsylvania.—Your agricultural number shows remarkable ability on the part of its editors. A literary department would be a vast improvement.

The Mission, Mission High School, San Francisco, California.—Brim full of fine material. Let us drink again from your cup of knowledge.

The Skip, Amador County High School, Sutter Creek, California.—"The Pink Dress" is a story that appeals to all. Improve the other departments to compare with your literary department and you will have an excellent paper.

The Wild Cat, Los Gatos High School, Los Gatos, California.—Bring your cuts up to the standard of your literary department and your paper will be noteworthy. "A Day in the Oregon Hills" fills us with a longing to be with the wayfarers.

The Messenger, Wichita High School, Wichita, Kansas.—The same old cry, more cuts! Your paper deserves good ones. "Interesting People" is an idea worthy of exchange.

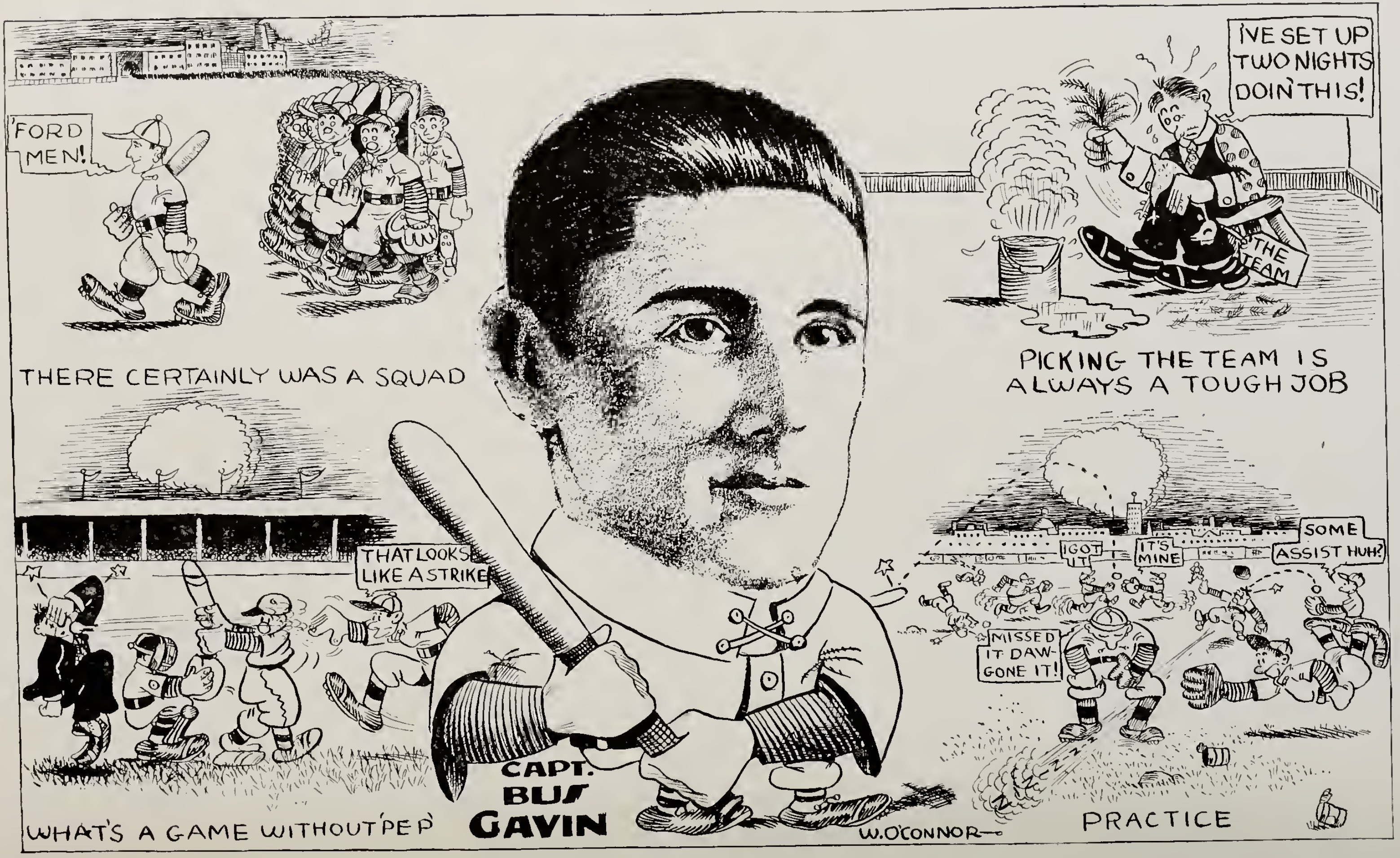
Keramos, East Liverpool, Ohio.—Your cuts are fine; keep it up, and bring up your joke column. Your stories are short but show originality. Come again.

Student Lantern, Saginaw High School, Saginaw, Michigan.—A fine paper but entirely too thin. Feed it with some more of your excellent material and it will thrive.

Oahuan, Punahou Academy, Honolulu.—Your paper is like a delightful breeze from your island telling us of your life through clever stories and editorials. Hawaiian breezes are always welcome.

Ye Searchlight, San Rafael, California.—A paper that will inspire other schools to good work. Your cuts, editorials, and stories are remarkably good. Enlarge your exchange list, for we all like to see ourselves as others see us.

The Spectrum, Jefferson High School, Portland, Oregon.—An excellent paper. "The Tale of a Rodent" is original, a fine quality. Try a few cuts; I am sure you will find them attractive.

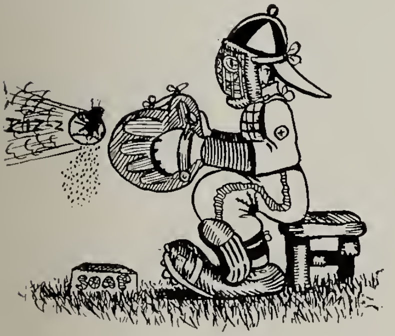

'FORD MEN!
THERE CERTAINLY WAS A SQUAD
I'VE SET UP TWO NIGHTS DOIN'THIS!
THE TEAM
PICKING THE TEAM IS ALWAYS A TOUGH JOB
THAT LOOKS LIKE A STRIKE
WHAT'S A GAME WITHOUT 'PEP'
CAPT. BUS GAVIN
W. O'CONNOR
I GOT IT
IT'S MINE
SOME ASSIST HUH?
MISSED IT DAW-GONE IT!
PRACTICE

Baseball

It has been some time since a baseball season started with as much enthusiasm and pep as this one has.

John Gavin, the heavy-hitting center-fielder of Wilmerding last year, will captain the team. Gavin is a hustler, and if the fellows get in and play with the right spirit, the Tigers will have a prosperous season.

Besides Gavin, there are many veterans who are back in the game. We will miss Norman and Chase in the box, but Carly is back again and his arm is rounding into fine shape. Goldstone, who has been showing a lot of speed around second base, is also a good pitcher, and it looks as if his "San Bruno Round House" will become famous. The Garat brothers promise to have another good season. Johnnie's brilliant playing at short is making them all take notice, and with Charlie behind the bat there are going to be few bases stolen. Waterhouse should have no trouble in making the initial bag. He has been playing a great game and always delivers the goods. In the outfield Kohlmoos, Urbais, Langhorn, Wyle and Young will fight it out for positions. It looks as if Captain Gavin is going to have a hard job in selecting his trio, for all the men are fast and heavy hitters.



New material is also plentiful, and these veterans will have to hustle or new men will be holding down their positions.

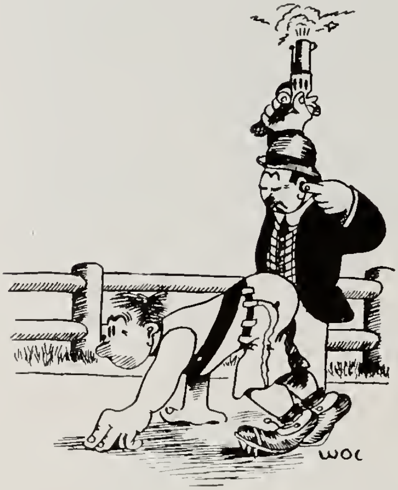
Owing to the late rains the team has not yet rounded into shape; but with the coming interclass and the many practice games it should be in rare form when the season starts.

Manager Daffy Maillot has been working overtime, having almost all his dates filled. Not only the best teams about the Bay, but also many country teams are on his calendar.

Track

The track for the past two years has not been quite up to the standard; that is, it has not shown the true school spirit of Lick-Wilmerding.

This last year we were a little late in starting, as the football season overlapped the track season. In the fall S. F. A. L. meet there were only a few fellows who gathered points. Those who did, certainly gathered more than their share, Midgley and Jacobs alone scoring over twenty points.



This coming season will certainly not be a repetition of last year. In the interclass track held last year, there were a number of young aspirants who showed good form and will certainly have to be reckoned with in the coming season.

It has been clearly demonstrated on every occasion that we have the material for a track team. Notwithstanding this fact, there are a number of the fellows who are just a little bashful about displaying their speed in public. Now for you fellows who feel this way about the matter, a little advice might be profitable. Track is not like football or baseball. In those two activities you either make the team or you don't. In track there is always a chance. If you cannot sprint for the short distances, you can develop good wind and run in the longer distances.

Then there is the chance of winning a block L.-W., which is the greatest honor that can be conferred upon you by the students, for proficiency in any sport.

This year by graduation we lose some of our best point getters, and it will be up to you fellows, who have the talent to run, to uphold the honor of the Black and Gold.

Basket-ball

The school has entered four teams in the S. F. A. L., three weight teams and one unlimited. Manager Parker, who managed last season's teams very successfully, was glad to lend his support by taking charge of the four teams this season, and is giving up much of his time to the work. He has thirty-nine men out, giving him two full teams for each weight division.

The use of the Exposition Auditorium for all games offers a splendid chance for the spectators to see every play, and it is the manager's and captain's hope that all the students will take advantage of this opportunity and witness the games.

The unlimited team under Captain Doherty is comprised chiefly of new material. Captain Buckley and Koenig are stars on the 130-lb. team. Captain Davis has a fast team. The 100-lb. team is composed mostly of Freshmen, who are under the instruction of Buckley and Davis.

Manager Parker wishes to express his thanks to the Lux girls for their support, and he also extends his thanks to "Roth," who has been active manager for the 130-lb. team. The new gym in the Wilmerding building offers a splendid opportunity for practice which helps the teams greatly.

The 130-lb. team had its first game on February 15. It was with Lowell, and the students supported the team well. All during the game the team showed a marked superiority over Lowell. Captain Buckley played a fast game, and every time he shot for a goal the score-keeper was ready to add to our score. The final score was 34 to 21.

The 100-lb. team played their game with Lowell after the 130-lb. team finished. Lowell's team had had more experience and won by a score of 72 to 12. Greene and Petri played a good game.

The 120-lb. team and the unlimited will play their games with Lowell on the 18th of February. The 120-lb. team is composed mostly of "vets."

Swimming

The swimming interclass was carried on successfully at Lurline Baths on January 19. From the results of the meet, Captain Holtz and Manager Davis are sure of having a winning team in the S. F. A. L. The '16 class won the meet by a score of 46, '18 followed with 23, and '17 was last with a score of 21.

The special events were won easily by Mutch and Lyle Anderson. In the plunge for distance Mutch made 44.6 feet, which was a number of feet more than his nearest competitor. In the saucer dive Anderson came up with a big smile and a saucer every time.

The results were as follows:

50 yards—Mutch, '16, first; Davis, '16, second; Rolph, '18, third.

100 yards—Davis, '16, first; Alexander, '16, second; Schlesinger, '18, third.

220 yards—Holtz, '17, first; Schlesinger, '18, second; Anderson, '16, third.

440 yards—Holtz, '17, first; Schlesinger, '18, second; Eaton, '16, third.

880 yards—Banfield, '16, first; Nelson, '17, second; Rosenberg, '16, third.

50 yards back stroke—Carley, '17, first; Banfield, '16, second; Holtz, '17, third.

100 yards breast stroke—Holtz, '17, first; Naumen, '18, second; Glover, '17, third.

Plunge for distance—Mutch, '16, first; Banfield, '16, second; Schlesinger, '18, third.

Saucer dive—Anderson, '16, first; Waterhouse, '17, second; Banfield, '16, third.

Relay—Sophomores, first; Seniors, second; Juniors, third.

Base Hits

Did you know that—

It takes some maneuvering to tie your tie at the mirror in the locker room?

And that Mains needs a haircut and that there are others?

And that Lowell won the championship—but we beat 'em?

And that Charles Dickens did not write like the "dickens"?

And that Pappas' store is across the street?

And that Mr. Merrill is the "principal" around here and that we students are of "interest" to him and are graded by "per cent"?

And that to take "physics" from Mr. Plumb is good?

And that "Sweet 16" is about to leave us?

And that the "New Wilmerding B'l'd'g." is old? Yes'm.

Life is a joke and all things show it;
Look at a Freshman and then you'll know it.

Miss Mize—Where are the tough cuts of beef found?
Soph. Maginnis—Around the arms and legs of the cow.

You talk of Napoleon crossing the Alps
  And battlin' six storms and a blizzard;
But the guy who can jar
Through a Sixteenth street car
  In my mind is a regular wizard.

Helen, on the way to Guerneville, chewing rapidly: "Mother, these are the nicest trains. They have such de-li-cious gum under the seats."

Miss Rinn, millinery: Miss Greninger, where is your transparent frame this morning?

In Geometry

'18X Alas! Alas! I can not see
Why, the Reason Why, must ever be
Attached to statements 1, 2, 3,
And so on to $\propto$

'18 J Cheer up! Cheer up! my frail young man.
I'll tell you why. I surely can,
The Reason Why, $\therefore$ and hence
Are there to teach you common sense.

About the Weather

There had been a spelling match in one of the country schools, and little Johnny had missed on "weather." Going to school the next day, he asked his friend Sammy if he could spell it.

"Yes," said Sammy; "W-E-T-H-E-R."

"Gee!" answered Johnny, "that's the worst *spell* of weather for a long time."

Heard in the First Aid

Miss Beard—If you were called to give first aid to a person who had fallen out of a ten-story window, what instruments would you bring?

A voice from the rear which proved to be M. Adams: "A shovel."

Lives of great men all remind us
That we do not use our dome,
For, departing in the morning,
We leave that blamed excuse at home.

Land of Two Dimensions

"In a land of two dimensions," said our instructor, "the traffic-cop would blow his whistle in only one direction. Now suppose two people of this land wished to pass. How would they do it?"

McCartney quickly answered: "It would be easy for Pries."

A word for Lyle Anderson:
Don't you think he's charming, girls,
With that classy fitting English suit
And those made-to-order curls?

Freshman (cutting out under garment)—Miss Crittenden, cut my neck.

HOCKEY FAST BECOMING POPULAR IN THE YARD.
J.J.B. OPCC
PAPPA'S STORE AT 12:30 P.M.
COME ON UP WID YER CLASS DUES
DID YOU EVER MEET HIM
LICK-WIL MERDING
GO GET 'EM—
FELLAS
RAHRAH 19 X !!!?
WE WANT LUX
AT THE RALLY
DAT A BOY
NICE WORK
SHOOT WILL YA
BASKET BALL IN THE NEW BUILDING HAS MANY SUPPORTERS
WHAT'S ON OUR MIND.
RAY
GIVE HER MORE GAS
TOOT TOOT
KEEP MOVIN'
MAKE IT FAST WILL YA'
2:15 WEDNESDAY
WHY NOT OPERATE JITNEYS WHEN CHANGING PERIODS
WHERE'S YOUR WORK?
WELL YOU SEE IT WAS LIKE THIS—
"A RARE OCCURANCE"
LEND ME A CAR TICKET WILL YA?
SLIP US DE HOME WORK
HOW MANY PAGES IN THE NEXT ISSUE "FRENCHY"
PERIODICALS
HEARD AROUND SCHOOL
LETS DO THE VERMIN RASTLE WALK!
WATCH YER STEP
CAN YOU DO THE HOP STEP AN' JUMP?
DANCING AT LUX
LICK- WIL- MER- DING
THE BOY'S CHORUS MAKES A HIT
PASS IT
LUX HAS SOME TEAM.
-W. O'CONNOR-

KRAZY KUTS

Who is the bo with the red-hot ties,
The larker?
Look at him yelling at all the guys,
The barker.
He can keep talking all the time.
His gift of gab is sure sublime.
'Tis Parker.

Extravagance

Isaac called on Levy and asked for finances toward a fence around the Jewish cemetery.

"Now," said Isaac, "the Protestant and Catholic churches have fences around their cemeteries, and we have none."

Levy quickly answered: "What do you want a fence for? Is there anyone on the outside who wants to go in?"

Isaac answered, "No."

"Well," said Levy, "is there one on the inside who can get out?"

"No," said Isaac.

"Why the fence? Why the fence?" said Levy.

Fat Cahn's our booking agent.
He's important as can be.
He's always got something to sell
Where'er his form I see.
And when you graduate from school,
And all your dough is gone,
Just go down to his hock-shop
And put your suit in pawn.

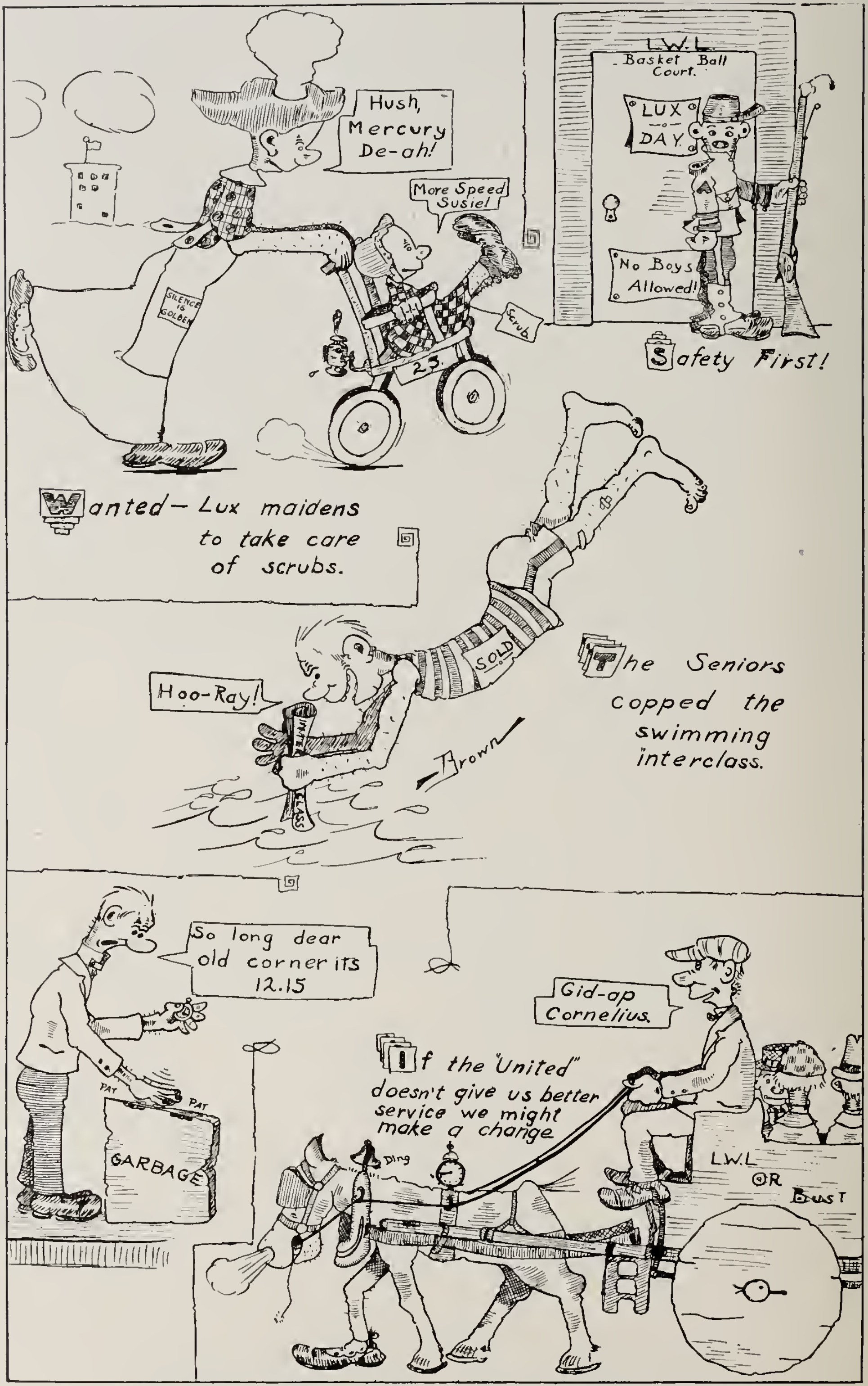
Miss Miller was inquiring of the students in the botany class what kind of soil was around their localities. M. Adams answered: "Mine is mostly bone dust; I live in a cemetery."

I heard the guys speaking of Sassus,
Who is cuckoo, so they hinted.
And I think it is true;
For, if not, the poor stew
Would never have let this be printed.

German patriot: "I have a brother in the German army who always is where the bullets are thickest. Ah, so brave!"

English listener: "Where is he—in the ammunition wagon?"

Scrub (looking at the new building)—Some building!
Senior (standing by, braggingly replies)—I helped make that.
Scrub (quite promptly)—So did my father.


Hush, Mercury De-ah!
More Speed Susie!
SILENCE IS GOLDEN
Scrub
25
Wanted — Lux maidens to take care of scrubs.
L.W.L. Basket Ball Court.
LUX DAY
No Boys Allowed!
Safety First!
Hoo-Ray!
INTERCLASS
SOLD
The Seniors copped the swimming interclass.
Brown
So long dear old corner its 12.15
PAT
PAT
GARBAGE
Gid-ap Cornelius.
If the "United" doesn't give us better service we might make a change
Ding
L.W.L OR BUST

Was It True?

There was a gang of men working at the city hall handling heavy crates of glass. As they staggered along under the load, a wise copper came by and yelled out to them: "I see you are working at light business."

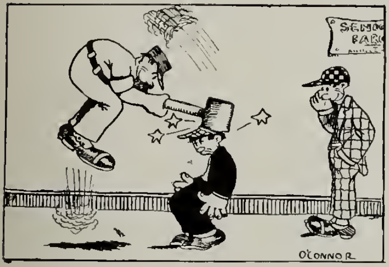
Some say Godon will be a pug
  And clean up every busher.
But as far as I see,
He is destined to be
  A third-rate chisel-pusher.

Mediums of Exchange

There was a discussion on the United States currency in our history class. Our towzley-topped camera king was asked: "What things are used as a medium of exchange?"

Andy promptly replied: "Gold, silver and (there was a long pause) and car tickets."

At Work in Forge



Collins, a Soph, stood in a state of anger, threatening to use a sledge on another Soph's head.

"Collins!" said a third Soph who was looking on, "look out or you will ruin his cap."

If someone started a contest,
  Or a trial for stars were havin',
The only guy to cop the crown
  Would be our own "Bus" Gavin.

He Won!

After looking over the class, Mr. Plumb asked Walsh if he knew where Flaherty was.

"Oh, he's hurt," answered Walsh.

In a very surprised state Mr. Plumb said, "Hurt!" How's that?"

"Oh," said Walsh rather disgustedly, "we were up on the third floor at Wilmerding trying to see who could lean out of the window farthest. Flaherty won."

Don't you pity poor "Dinky" Aaron?
  Luck never knocked at his door.
If it rained gold nuggets in London,
  He'd be in Singapore.

There is a youth in our school,
He seems to be so wondrous wise.
If you should tell him anything,
He'd say, "Here's one of those hard guys."
But he's a jolly sport, 'twould seem.
You guessed it; yes, his name is Dehm.

Miss Denny—Mr. Vulci, name some of the common meters of verse.

Vulci—Pentameter, hexameter, octometer, ——er, er——

Voice in rear: "Gas meter."

A New Game of Pool

Browne and Greene were witnessing a game of golf.

"Do you know what that game is?" asked Browne.

"Well," said Greene, "it looks to me like a game of golf—ain't it?"

Browne looked at Greene disgustedly and piped out: "Oh, no! They're playin' cow-pasture pool."

Ah! our spirits are all broken,
Life is such a dreary bore;
When a scrub walks 'cross the corner
We can't throw an apple core.

ALL ABOARD FOR THE SENIOR FARCE!

The Senior Farce

Now all ye hark, who have a care,
And come ye one, and come ye all,
And seize ye this occasion rare
To laugh at Knights' Columbus Hall.

Reserve the night of April First,
Conserve your laughter until then,
Observe our Seniors start at eight,
Preserve Mr. Panmure until ten.